Precision SHOOTING

DECEMBER 1965
Vol. 10, No. 8
40 cents

a magazine for Shooters by Shooters

Precision SHOOTING

PUBLISHED MONTHLY BY PRECISION SHOOTING, INC.

Editorial and business office at
Lyndonville, Vermont 05851.

Editor—P. H. Teachout
President—Creighton Audette
Vice-President—Dermot Reilly
Treasurer—P. H. Teachout
Clerk—Frederick G. Mehlman

Subscription rates:—To the U. S., Canada and Mexico, 1 year $4.50, 2 years $8.00. All other countries $1.00 per year additional. Change of address requires 30 days' notice.

Place of Publication—Cowles Press, Inc., St. Johnsbury, Vt. Second-class postage paid at St. Johnsbury, Vt.

COVER PHOTO

Frank Dreyer, consultant on sales and marketing policies for Frank A. Hoppe, Inc., presents the Hoppe Memorial Trophy to Dr. Theodore Charlton, the 1965 Pennsylvania Outdoor Smallbore Rifle Prone Champion. Looking on is Paul Fry, Pennsylvania Rifle and Pistol Association official. The championship matches were held at the Dormont-Mt. Lebanon Sportsmen's Club, Pittsburgh, Pa.

The Hoppe Memorial Trophy, a sterling silver cup, was presented in 1938 to the Pennsylvania Rifle & Pistol Association for annual competition in honor of the firm's founder, Frank A. Hoppe.

• • •

POINTS TO PONDER

No particular rifle cartridge is of itself "accurate," and conversely, no particular rifle cartridge of itself need be considered "inaccurate." The measurement scale of accuracy of any rifle cartridge depends upon the quality of the rifle it is fired in and the loads that are fired in it.

Some rifle cartridges have gained reputations for outstandingly excellent accuracy but, in most cases, those deserved reputations have been established by observed and recorded performance in rifles of superior quality and superior ammunition. Let's consider some specific examples.

The 222 Remington is one such cartridge. Soon after it was made available it was tested by the bench rest competitors and was found to be an "efficient" cartridge for obtaining the velocities found to be desirable for top accuracy with .22 caliber rifles for 100 and 200 yard target competition. Many bench rest record groups and aggregates have been made and are still held with rifles chambered for the standard 222 Remington cartridge. Those records have been made with top quality custom made rifles especially designed for bench rest competition in the various classes and with carefully hand loaded with selected components ammunition. While any of those rifles which are used for long in competition do deliver superior accuracy, not all of them are record breakers.

Many mass produced factory rifles chambered for the 222 Remington cartridge do deliver or can be made to deliver outstanding accuracy, but a much greater number of such rifles never delivered more than just fair to no better than mediocre accuracy.

The wildcat 22/250 cartridge has long held an enviable reputation for very excellent varmint shooting accuracy. In the early days of modern competitive bench rest shooting, rifles chambered for this cartridge won many matches and aggregates. However, later experience indicated that its powder capacity was larger than necessary and that smaller capacity cartridges were more efficient for attaining the velocities desirable for top accuracy in competition and the 22/250 has become obsolete for bench rest competition. It has, however, retained its reputation as an accurate, efficient cartridge for varmint shooting. As a wildcat, the 22/250 had to be chambered in custom made rifles, most of which had relatively heavy, stiff barrels. The best of the rifles were made by competent riflesmiths, jealous of their reputations. The sour ones, made by incompetent cobblers, we never read about.

With the 22/250 cartridge now available as a factory load, and mass produced rifles, which are assembled with a minimum of expert hand fitting, available for it, it will probably have a ready sale because of its long established reputation. Some of the rifles will doubtless deliver fine accuracy, more will deliver fair to good accuracy and some owners will be quite disappointed with the accuracy of the rifle they purchase—which same will be true for rifles of any other caliber.

Quite recently heavy bench rifle class rifles chambered for 308 Win. cartridge have been winning important matches and aggregates. Lighter class rifles have been giving good but generally not yet winning results. In NRA high power rifle and in ISU competition the 308 or NATO cartridge is giving winning performance.

Some factory mass produced relatively light weight sporter rifles chambered for the 308 cartridge deliver very good accuracy, good enough to double for ordinary varmint shooting. The run-of-mill such rifles that I have used and seen are quite adequately accurate for big game hunting at normal ranges for such shooting. But some I have seen I wouldn't care to own. And so it goes for all cartridge calibers.

The standard factory cartridges most highly developed for accuracy are those used in some type of competitive target shooting, and the superior accuracy attained is with rifles specifically designed for the type of target shooting done. For such shooting the ammunition is quite generally handloaded with selected components. So far as I know, with the possible exception of one or two cartridges for long range target shooting, there are no factory loadings of special target grade center fire ammunition available today. (One other exception would be some special .30 cal. ammunition made in government plants, but that would not be generally available to civilian shooters.) Even in bullets, to the best of my knowledge, the only selective choice of U. S. factory made target grade bullets are in .22 and .30 caliber.

The average-Joe potential rifle purchaser would do well to ponder some of these points and should not be too disappointed if the highly touted caliber sporter rifle he purchases at the local gun store does not prove to be a tack-driver.

P. H. T.

• • •

SOME COMMENT

(The following comment was contained in a letter from Jesse M. Grigg —Ed.)

The November issue of P. S. is an extra good one, for it deals with no less than six subjects of interest to me.

Mr. Audette's article interested me most of all, though I believe that it provides very little support for the barrel vibration theory. A finger-nail file tap on a barrel may cause vibration, yet as the total energy in any form of vibration cannot exceed the imparted energy, the amplitude will be small. This goes, too, for the jar due to striker fall. To cause vibration at any particular amplitude the applied force must be capable of first bending the barrel to that amplitude.

The curves shown apparently do not strengthen the case. For, after taking to account the manner in which they were obtained, it is seen that they refer to displacement at only one particular place in the barrel, and therefore register only the whip plus or minus what that particular place has moved in bending. Thus they tell nothing exact about the direction of the muzzle tangent at time of bullet emergence, which tangent direction helps to determine bullet direction. Moreover, true vibration does not begin before the bending force has abated.

The latter statement will have more weight after the time element has been considered. Assuming for the service rifle that the mean velocity in the barrel equals half the muzzle velocity, or 2700/2, the barrel time is about .00148 second. The quoted frequency of the fundamental node is 61 cycles, this corresponding to .0164 second for a complete oscillation, or .0041 second for a swing from zero to maximum amplitude or the reverse. Thus the barrel time is about 35 per cent of the time needed from in to out in true vibration.

Further, a marked difference between the initial bend and a true vibration swing becomes apparent when it is considered that at time of striker fall the bending velocity relative to the barrel axis is zero instead of maximum, and that at time of bullet emergence, instead of being momentarily at rest, the muzzle has a relative velocity which further increases the curvature of bend after the bullet has gone. Therefore this initial whip bend in no wise corresponds to one of the quarter swings that will occur after the bend has reached its full value sometime after the bullet has emerged. Thus the oft-repeated term "barrel vibration" is only a figure of speech—a misname for the whip bending whose energy becomes vibration after the bullet has gone.

Irregular interference with recoil changes the manner of this whip bending and in turn the point of impact. Taking account also the effect of irregular placement in the chamber of unbalanced bullets it is easy to see why the notion of haphazard vibration was invented.

• • •

SENSIBLE COMMENTS

(The following comments are released by the Shooting Sports Association, Inc., 1075 Post Road, Riverside, Conn. 06878 and excerpted from the official record of hearings held by the House Ways and Means committee in 1965.

It would certainly do no harm to write these people at their Washington, D. C. office addresses and commend them for the very sensible attitude they have expressed. P. H. T.)

"The bill (Dodd bill) doesn't accomplish anything outside of raising revenue and creating a bigger bureau for registration of guns . . . . All it does is harass the sportsmen and the legitimate people who are entitled to carry guns in this country, and it doesn't accomplish the purposes or intent that the public has been led to believe it does."

James A. Burke, Representative
from Massachusetts

* * * * * * *

"The fact that there have been few instances of illegitimate use in comparison to great numbers of legitimate uses of firearms should not penalize those who legitimately are trying to use firearms and use them in the right manner."

Frank J. Horton, Representative
from New York.

* * * * * * *

"Certainly, the rapid increase in crime of all types is alarming and deserves the immediate attention of all Americans. But we have become sidetracked in our attack against crime. While we should be concerting efforts into community action groups, educational programs, and establishing a sense of responsibility at home and among our youth, we attack instead one side effect of the problem.

". . . What actually exists today has existed for years, namely, a crime problem. If the bulk of our attention at solving the crime problem is directed only at guns—as it is today—the problem will never be solved. The laws which are being proposed before this committee are a misguided effort to remedy effect rather than cause."

E. Y. Berry, Representative
from South Dakota

○ ○ ○

PENNSYLVANIA STATE FREE RIFLE CHAMPIONSHIP

Of the 41 competitors in the Pennsylvania Free Rifle Championship matches (smallbore, three position, 50 meters) held on the Murrysville Rifle Club range September 25th and 26th, 8 were from the USA MTU of Fort Benning, Georgia, and 7 of them took the top 7 aggregate rankings and the 8th took the 12th place ranking. High civilian shooter and Pennsylvania resident champions was 8th place M. Eddy from Brave, Pa. The high 14 shooters had aggregate scores over 1100. They were:

W. E. Krilling MTU 1142-26x; M. I. Gunnarsson MTU 1140-13; D. Dingman MTU 1136-23; D. W. Kimes MTU 1130-22; J. McHugh MTU 1130-17; D. Ross MTU 1128-15; D. W. Adams MTU 1127-20; M. Eddy, State Champion, 1126-9; Patricia Kinsella, Morgantown, W. Va., High Lady award, 1125-19; G. Wenzloff, Allen Park, Mich., High Junior, 1122-11; A. J. Holoubek, Morgantown, W. Va. 1118-18; J. K. Frazer MTU 1116-15; R. K. Moore, Claysville, Pa. 1114-19; T. Y. Wu, Ann Arbor, Mich. 1101-15.

D. Adams had high prone score of 395-12; D. Ross high kneeling of 387-10; and M. Gunnarsson high standing of 369-4x.

Eleven of the competitors were of Junior classification, including two girls from Lancaster, Pa.

• • •

HOPPE'S GUN CLEANING KITS

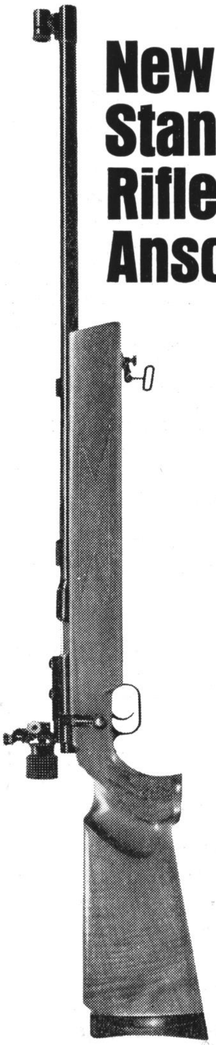
HOPPE'S gun cleaning kits in the new partitioned plastic box provide a practical, neat, easy to pack means for taking along and keeping together essential gun care items on a hunting trip.

The kits contain a cleaning rod (jointed rod for rifle and shotgun), No. 9 solvent, gun oil, cleaning patches, silicone wiping cloth and the little "Guide To Gun Cleaning" booklet, all in their fitted compartments in the neat plastic box that appears rugged enough to stand considerable rough handling in transportation. The box I have is 13¾" long, 5" wide and 2" deep, with rounded corners. The kits are made up for rifle, pistol and shotgun and various combinations.

The jointed rod, when assembled, seems the stiffest of any such rod I have seen—the joints are long and well fitted.

P. H. T.

REPRINTS of the articles dealing with bench rest shooting are available from Precision Shooting at the following post paid prices: "Conditions" by Dr. Sam Nadler 25¢. "Precision Mechanical Rest Systems" by A. H. Angerman 40¢. "Bench Rest Shooting From Sand Bag Rests" by Ed Shilen 25¢.



New I.S.U. Standard Rifle from Anschutz

How can a rifle designed especially for international matches be just what U.S. smallbore shooters are looking for? Easy. The Anschutz people built a position rifle to meet the new International Shooting Union "Standard" classification. What they came up with happens to be ideal in weight and stock design for U.S. match requirements.

It's built on the same Match 54 action that was used by 7 out of 10 of the smallbore shooters in the Tokyo Olympics (and all the medal winners).

The 1408 weighs about 10 pounds, easily meets the I.S.U. limit of 5 kilograms with sights. The single stage trigger, adjustable for weight of pull, creep and backlash, is set for 500 grams (1.1 lbs.). A replacement spring is included to convert to a 3 pound pull for U.S. matches.

The ⅞″ diameter, 27½″ barrel is precision rifled and hand-lapped for peak accuracy. The French walnut stock has adjustable butt plate, raised cheek-piece, contoured pistol-grip and a deep fore-end for position shooting. Full length swivel rail and scope blocks. **$145.** (Sights extra.) Left-hand stock, **$157.**

Prices subject to change. For free full-color catalog, write: Savage Arms, Westfield 143, Mass. 01085. (A Division of Emhart Corporation, Savage, Anschutz and the Indian head Reg. U.S. Pat. Off.)

Savage
ANSCHUTZ

THE TWIST OF RIFLING IN RIFLES

By F. W. Jones

(This article was originally published in "ARMS & EXPLOSIVES" (British), April 1, 1916. pp 47-50. This copy is supplied to Precision Shooting by Mr. G. W. P. Swenson, now a resident in England. Mr. Swenson also adds that "F. W. Jones was the designer of the .280 Ross and .275 Holland and Holland magnum cartridges, and the inventor of the progressive burning smokeless powder. He also won about everything in the long range competitions over here." — Editor)

Hitherto, the amount of rifling twist considered necessary to maintain end-on flight on the part of small arms bullets has mostly been settled by empirical methods. Tabular figures exist for ordnance, and small arms projectiles have been assumed to follow the same underlying laws. Whether they do or do not will be considered in the present article. If discrepancies are proved to exist ordnance will only be involved to the extent that a parallel inquiry might appear desirable. Since particulars of the kind here brought under review are only available with regard to small arms, and similar particulars regarding ordnance are not readily accessible, the treatment will be rigidly confined to this class of weapon and ammunition regarding which a large number of critical facts have been collated.

A small arm designed to fire a bullet is rifled because accuracy of shooting is improved. If an elongated bullet were fired from a smooth bore the bullet would, soon after leaving the barrel, sets its longer axis across the direction of motion of its centre of gravity, and erratic flight would result. A bullet is made of greater length than its diameter to increase its sectional density and so enhance its power of getting through the air. To make a bullet during flight constantly present its nose first to the resisting air medium, it must be caused to revolve on its longer axis with a rotational velocity sufficient to overcome other tendencies. The necessary minimum value of this rotational velocity has been the subject of mathematical analysis, and in textbooks on gunnery, tables are to be found setting out the minimum twist of rifling necessary to give stability of flight to projectiles of given length. In actual practice gunmakers have in many cases ignored these tables and as a consequence there are in existence many rifles with a twist of rifling far in excess of that given by the tables as necessary to ensure stability of flight to the bullets fired from them. On the other hand, of late years, evidence has been accumulating that the published tables give a minimum value for twist that is excessive. To adopt a twist of rifling more rapid than is necessary to ensure stability of flight serves no useful purpose, and is in fact objectional, because in adding to the resistances in the barrel, velocity is lost for any given combination and level of pressure. Also accuracy may be impaired by excessively spinning the bullet, although, between the necessary minimum spin and an excessive spin that is unstable in practice, there is a wide limit.

There is evidence in abundance that a twist of rifling suitable for a bullet at one muzzle velocity will be satisfactory for the same bullet fired at some other velocity. For example Mark VI .303 bullets—215 gr. round nose—fired from a service rifle at the muzzle velocities of 2,000 f.s. and 1,000 f.s. are equally stable in flight. That the minimum velocity of rotation sufficient for stable flight should bear a definite relation to the velocity of translation, or rate of flight, has been proved by practice and is in accord with mathematical analysis. This being so it is interesting to observe that the Mark VI. bullet, for example, fired at a muzzle velocity of 2,000 f.s., will, when its velocity is reduced by air resistance to 1,000 f.s., have a spin in excess of that necessary for stability. In course of flight the translational velocity is reduced much more rapidly than the rotational velocity. **This fact leads to the conclusion that when experiments prove that a bullet is stable in flight for moderate ranges and is unsteady at extreme ranges, evidence of excessive spin is clearly manifest.**

For the purpose of specifying the twist of rifling independently of bore, the bullet is stated as (N) calibres in length and the twist of the rifling is expressed as one turn in (n) calibres. For example the Mark VI. .303 bullet has a length of 1.25 inches or:—

$$N = \frac{1{\cdot}25}{0{\cdot}303} = 4{\cdot}13$$

and the service rifle has a twist of rifling of one turn in 10 inches or:—

$$n = \frac{10}{0{\cdot}303} = 33.$$

The English table of rifling, published in books on gunnery, was calculated from formulae developed by Sir George Greenhill, F. R. S. In this table a bullet having the value N=4.13 requires a twist of rifling n=35—the latter closely reproducing the twist adopted for the service rifle.

As mentioned above there is evidence for the twist that are in excess of the ex- that the English table of rifling gives values perimentally proved satisfactory values. Four instances may be mentioned which definitely prove that twists of rifling very materially less rapid than the table values have imparted stability to bullets. The minimum effective twist is, therefore, less than that given by the English table. Match rifle shooters employed with great success the .303 and other service actions for firing pointed .303 bullets 1.46 inches long. A bullet of this length should require, according to the English table, a minimum twist of rifling of n=30.3 or one turn in 9.2 inches. But the rifles which performed such good service at long ranges had a twist of one turn in 10 inches. In other words excellent shooting results were obtained in rifles having a twist 8 per cent less than the necessary minimum as laid down in the English table.

In 1886 the Lebel fired a bullet 1.26 inches long, and the rifling of the barrel has a twist of one turn in 9.45 inches, i. e., N=4.0 and n=30. The present French bullet (Balle D) is fired from this rifle, notwithstanding that the bullet measures 1.575 inches long. The bullet, being composed mainly of copper, has the comparatively low specific gravity of 8.5. For this bullet N=5.0. The English table makes the minimum twist,

$$n = 28{\cdot}44 \times \sqrt{\frac{8{\cdot}5}{109}} = 25.$$

The multiplier under the square root is to take account of the difference in specific gravity of the brass Balle D, and that of a lead bullet of 10.9 specific gravity, for which the table is calculated. The English table says that Balle D requires a minimum twist of one turn in 7.9 inches. The bullet is apparently fired with success in a rifle with a twist of one turn in 9.45 inches or a twist of rifling 16 per cent less than the English minimum.

The .22 Hi-Velocity cartridge contains a bullet with the characteristics N=3.5. The English table states that the rifle to fire this bullet should have n=42.4 or one turn of rifling in 9.6 inches. The Savage Arms Co. adopt a rifling of one turn in 12 inches, a value 20 per cent less rapid in twist than the English table minimum. The final example is so remarkable that, if it stood alone, it would be sufficient to condemn the English table. The rifles originally manufactured to fire the .280 match cartridge had a rifling of one turn in 8½ inches, and the bullet was at that time 1.25 inches long. In 1913 and 1914 when the .280 cartridge gave such extraordinary evidence of fine shooting at the Bisley Meetings, the bullet measured 1.54 inches long, or N=5.7. This length requires, according to the English table, a rifling of one turn in 6.9 inches for a bullet of 10.9 specific gravity; but the .280 bullets were of less specific gravity, and therefore the rifling should be even more rapid. The rifles which gave with this ammunition the very high-class shooting mentioned, had twists of rifling mostly one turn in 9 inches and a few one turn in 10 inches. The last named shot quite as well as the first named. The .280 therefore proves that the English table gives a value for the minimum twist of rifling necessary for stability of flight more than 31 per cent in error. These four examples should demonstrate to gunmakers that it would be wise to regard the English table as giving a value for the necessary twist of rifling in excess of that which may be found necessary.

Col. Zaboundski published a table of rifling which specifies even a more rapid twist for a bullet of given length than the English table. The differences between these two tables is small for short bullets, but for those of the length of the .280 the difference is considerable. The English table specifies for the .280 one turn in 6.9 inches, and the Zaboudski one turn in 4.9 inches. Actual practice has proven that one turn in 10 inches is satisfactory. Even this degree of twist may be in excess of absolute necessity from the point of view of preserving stability of the bullet's flight. In view of this evidence the Zaboudski table can be disregarded.

The accompanying diagram (not necessary) has been prepared to show the practice as it exists in comparison with the English table and in comparison with certain new proposals that will be made later. The spots indicate the relation of bullet lengths and rifling adopted in the military small bore and large bore rifles, the details of which are published in the Text Book of Small Arms, and also relations for sundry express rifles which have been examined; finally a few of the published particulars of American sporting rifles have been added. The interrupted line represents the English table values. It will be at once obvious that the practice of gun-makers is far from uniform. Of the 53 examples spotted most of them have too rapid a twist of rifling, and some of these are 50 per cent more rapid than is called for by the English table. Put in another way, where the English table says that a bullet requires a rifling of one turn in 15 inches, gunmakers have frequently made the error of adopting one of 10 inches. The fact that this degree of error has not caused serious trouble is proof that a pedantically accurate rule for arriving at rifling is not necessary. Therefore, a rule may be accepted on account of its simplicity, provided the error is not great and is always on the side of giving too rapid a twist of rifling. A table, buried in a text book of gunnery, or a formula involving complex functions, is likely to be equally unavailable to gunmakers. Even the use of characters denoted above by N and n are undesirable if sufficient accuracy can be obtained by employing the more usual quantities namely length of bullet in inches and twist of rifling in inches for one turn. On this basis the English table is approximately and very simply expressed as:

$$L = 150_{5} \frac{d^2}{l}$$

where L=the length in inches of one turn of rifling

l =the length in inches of the longest bullet it is proposed to employ

d =the diameter in inches of the bore.

It has been shown that the English table gives too rapid a twist of rifling. To correct this defect without exceeding the slowness of twist of such rifles as the .280 and the .22 Hi-velocity, the following formula is put forward for adoption:—

$$L = 180 \frac{d^2}{l} \qquad (1)$$

An expression of the above form gives a necessary although small twist of rifling for a round ball. Obviously in this case there is no question of keeping one axis of the ball in the direction of motion, but as an ascertained fact there is no doubt that a round ball which is spun by rifling, shoots more accurately than another fired from a smooth bore. The explanation is not one of gyroscopic action but the improvement is more likely due to the spin presenting all surface irregularities equally to the resisting air-medium, and also to avoiding the uncontrolled lateral spin caused by the ball from a smooth bore touching one or other part of the barrel and thus giving a golf ball "slice" or "pull" effect.

The formula refers to bullets of 10.9 specific gravity or approximately that of lead. For ball and shot guns, and lately for military small bores, bullets have been introduced of a composite nature with a specific gravity as a whole much less than 10.9. This difference in specific gravity must in these cases be considered. If W_1 is the weight of a bullet and W_2 is the weight it would be if made of solid lead, then the value given by the formulae must be multiplied by

$$\sqrt{\frac{W_1}{W_2}}$$

For example, a bullet of a given shape and length which has one fourth the weight it would realize if made of solid lead, must have a twist of rifling of one turn in half the length that would be sufficient for the lead bullet. The usual metal covered bullets, entirely filled with lead, may be taken as equal in specific gravity to 10.9.

The formula (1) although accurate enough for all practical purposes differs from the English table that has been developed from first principles in giving a necessary twist for a round ball. A formula which fulfills this theoretical condition and also takes account of the excessive twist given by the English table is as follows:

$$n = 95 \div (N - 1)^{2/3} \qquad (2)$$

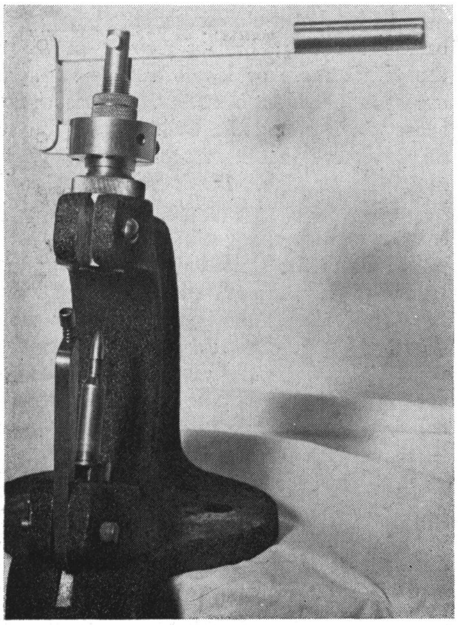
Curves from formulae (1) and (2) are drawn on the diagram and are marked respectively I and II. The two curves are nearly coincident between n=2.5 and n=4.0, and as these limits include nearly all the usual rifle bullets, gunmakers may adopt the simple formula (1) without misgivings, although formular (2) must be taken as more accurate for bullets of unusual lengths.

Rifles that are correctly rifled may give erratic shooting; bullets may even strike the target more or less broadside-on from causes independent of rifling. To insure accuracy in shooting the bullet should be so manufactured that its centre of gravity lies in its longer axis. Furthermore it should be contained in the parallel part adjoining the base which engages in the rifling. The bullet should be started up the barrel with its axis lying in the axis of the bore, and the fit of the bullet in the barrel should be such as to maintain this condition during the whole of its journey up the barrel. Also the bullet should not become unsymmetrically deformed while in the barrel. **When these conditions are fulfilled the bullet is said to be correctly centred.** In actual practice centering is only more or less accurate. The unsuspected presence of this defect is mainly responsible for faulty shooting. Perfect centering depends on **a true lead** joining the chamber to the rifled portion of the bore, the **correct positioning of the bullet in the lead** at the moment of firing, and **exact boring.** These qualities should be associated with a bullet correct in form and accurate as regards all details of manufacture. Experiments to determine the minimum suitable twist of rifling are difficult to make owing to uncertainty in the above items. Experiment frequently supplies examples of rifles of identical twist shotingo the same bath of cartridges with different degrees of accuracy. Tests between two twists of rifling have therefore to be exhaustively carried out before any definite conclusion is possible. In deciding the specification of rifles gunmakers would be wise to follow the lead established by practice which is deemed to be correctly expressed by the formula (I).

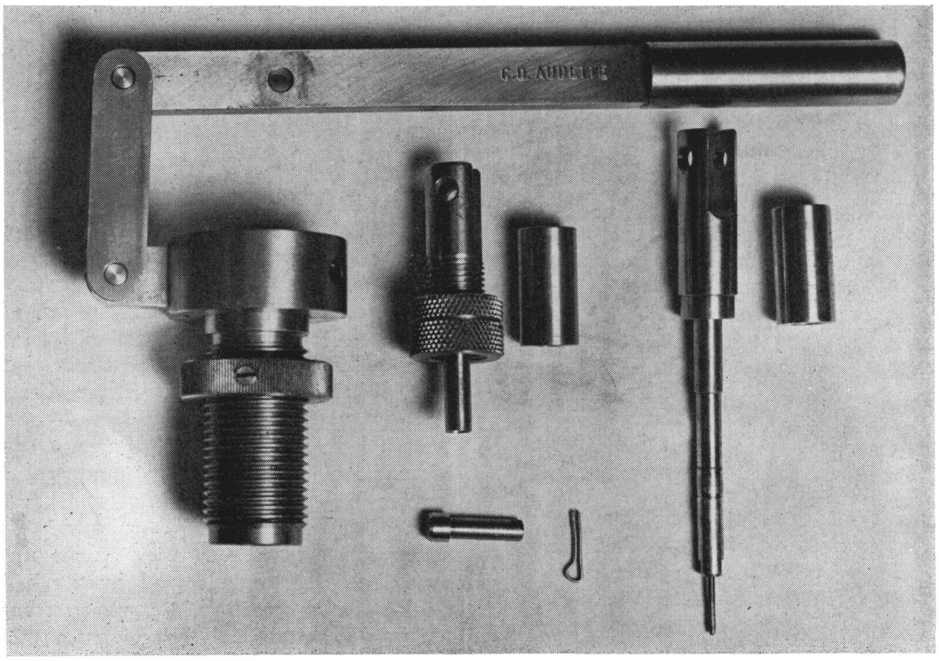
ELECTRIC ENGRAVING TOOL

A new electric engraving tool has been introduced by Dremel Manufacturing Company, Racine, Wisconsin.

The Model 290 Engraver is a heavy duty, compact tool that provides a fast, permanent method of engraving names or identification numbers on steel, copper, brass, silver ,aluminum, glass, plastic, ceramic, wood, etc. Wirte the makers for complete information.



Precision loading die assembled in press.



Precision sizing and loading die body with inserts and bushings.

PRECISION LOADING AND SIZING DIES

By Creighton Audette

The accompanying photos show a set of precision loading and sizing dies that I made two or three years ago. The operation is quite simple, fast, and produces loads which are sized and loaded so the biggest variation in alignment of case and loaded bullet is that produced by variations in the brass, itself.

The main body is reamed with the same chambering reamer which is used in chambering the gun barrel. The upper end is line bored so the neck sizing bushing and the seating bushing are close sliding fits. Expander spindle and seating stem are close sliding fits in their respective bushings. The die body is screwed into the frame of the loading tool until the raised ram will bottom against the body at full stroke, just hard enough to keep the ram raised. The top lever holder can be swiveled around the die body and locked in any convenient loading position.

For neck sizing and expanding the case is inserted in the ram, ram raised and the neck sizing bushing and expander spindle allowed to rise. With the ram locked in the up position, the loading die handle is pressed down, neck sizing case and expelling primer, then the ram of the loading tool is dropped, expanding neck. Primer seating can be done then, or separately, as preferred.

For bullet seating, the die bushing is held from moving upward as the ram is raised by a screw with an eccentric head (this is simply turned out of the way when sizing). Bullet is inserted in die from below, ahead of the case, ram is raised to locked position, while the handle of the die is allowed to rise, then die handle is pressed down, seating bullet.

Since the die is reamed with the chambering reamer and because all operations except expanding are carried on with the case fully supported in the die and parts mechanically held in alignment, the concentricity of the loaded cartridge is as good as the springback of the brass during sizing and seating. The expander is made with concentric tapers top and bottom, leading to a narrow cylindrical section about .025" long, so there is no tendency for the neck to get expanded off center, since the expander starts up through the fired size of the neck. (This is one criticism I have of many of the expander plugs of commercial loading dies. The expander is roughed out in a screw machine, leaving the O. D. oversize, is then heat treated and centerless ground. The cylindrical section is often much too long, and is not concentric with the tapers, which are usually too steep. If you watch the case neck closely while using one of these, you will find that the steep taper, eccentric to the sizing diameter, pushes the case neck off center at the start of expanding and the long cylindrical section then forces the expander to continue to travel off center.)

No, I can't prove that loads made up this way will shoot better than any other way, although there have been some tests which seem to indicate that this is so. I do know that loads made up this way, with bullets seated out to touch the rifling (so as to check the concentricity) show a more uniform bearing and I have more faith in the accuracy of such loads.

NOTES ON THE 6.5MM/300 WEATHERBY

(Editor's note: The following letter to Fred Hallberg contains information that both Fred and I believe will be of interest to many riflemen. It is herewith printed verbatim.)

Mr. Fred W. Hallberg:

I read your September article in Precision Shooting and enjoyed—especially your analysis of RPM and the 6.5 caliber. Will have to send this through Phil Teachout as I don't know your address.

I won't burden you with advice, but will relate my findings and experiences, also those of Al Hoyer, a Pennsylvania gunsmith who has fixed several barrels for me.

I am the crackpot who went overboard on necking down the 300 Weatherby case to 6.5 instead of using the already too big 264 Winchester case. I don't take too much stock in the term "overbore capacity." Even the 30-06 is that way if you use 3031 powder and a 220 grain bullet, but if you use 4350 or 4831 you can get the proper balance, the same as you can in my big case with proper powder. I have settled on H870 ball powder for this. It is cool burning, practically fills case for peak pressures and contributes to long barrel life. Other terms I don't pay much attention to are "sectional density" and "ballistic coefficient." I prefer to go scale as to size, both bullet and its relation to bore and twist. (More about my figuring, or logic, later on this subject.)

I will describe my rifle and barrels used. When Winchester finally got bugs out of 264 and a few leaked onto market in 1960, I was anxious to build one as I had the ingredients, an FN action, a heavy target stock for same and a discarded but good 6.5X308 barrel my son had removed from an International Free rifle. This barrel already had 2000 rounds through it. A Bliss Titus make of very tough steel. It was an exact .264″ groove diameter and a 9″ twist. When I found I could not buy 264 empty brass I decided on the big 300 Weatherby case as I had a good supply one time fired. After building up loads with H870, H200, both ball, and H570 and 5010MG, both conventional but very large grain, I settled as stated before on H870. I had much advice, mostly to the effect it was "overbore capacity," too much twist for 3400 estimated velocity (later proven correct by Hodgdon and Lake City Ordnance). I arrived at pressures by building up a grain at a time until I smoked primers, then cut it 3 grains. Tests were made on warm day with cartridges in sun. I had never fired rifle at 1000 yards, but made my estimations from 600 and was on with 1st sighter. I won our New Mexico State match version of Wimbledon. I went on to Camp Perry (1961) and got in Leech shoot off with 100-11V. Just missed Wimbledon shoot off. Next year (1962) I duplicated this. Barrel still had good life but I began to worry at 2000 more rounds. I ordered a Douglas target blank, one in 9″, 1¼X¾X30 in his Timken steel. I thought this would be last word in barrel life but it went out at 500 rounds . . . too soft . . . I missed 1963 and 1964 matches with my caliber, but went back this year. Two or three others with same caliber were there. My son P. J. used my rifle in Wimbledon for a 100-14V but didn't get in shoot off in next relay. I had a 17V coming up on my relay which would have gone over good but one of those V's was a 4 for a 99-16V. No alibi . . . I just slipped on the 17th shot and called it. Captain Wigger shot one of these in Wimbledon shoot off but was eliminated in 1st 10. He had a 50-6V. They were strung from 12 to 6 and not over 2″ wide. I watched him shoot. He is one of the world's best shots. Al Hoyer had just checked load but in another rifle on Ordnance Chronograph which ran between 3412 and 3426 at 70 odd feet; very uniform. I felt sorry for both Wigger and Hoyer as something went wrong. Hoyer took gun apart and found weak mainspring (possibly this could have caused it).

Before going to Perry, at our state match, my son won our Wimbledon. Joe Deckert was second with a similar case (Ackley sharp shoulder version). I ran fourth. It was quite a win against some of the nationally known 30 cal. people. In September I won a Wimbledon type match for Southwest New Mexico. Conditions were none too good. I went out of black only once but it was a good one—a 3.

Redfield Gun Sight Co. makes available to shooters a handy, dandy little Ballistic Drop Chart, free for the asking. The chart allows the shooter to record ballistic information for a variety of loads, and is designed to be applied to the floor plate or stock of the rifle for quick reference. Address requests for drop chart to: Redfield Gun Sight Co., 1305 South Clarkson, Denver, Colo. 80210.

I might add that this barrel is a Douglas premium Chrome Moly 1¼X¾X 30″, 8″ twist. Never bothered to measure groove diameter. This barrel had 1300 rounds through it at end of Camp Perry this year. I decided to burn it out by fire forming 400, 300 H&H super cases for my next barrel. About 100 were shot target fashion and others were merely blasted out. I cleaned barrel and it looked almost as good as before. The lands still mark bullets. Enclosed are several 100 yd. groups fired after long run of fire forming. (Ed.: These were five 5-shot groups of from 13/16 to 1¼ inch center-to-center spread.) It is good enough that I have decided to use it "as is" in a big match coming up October 23 and 24 . . . a registered match with a Wimbledon type match included. Have also decided to cut 3″ off breech end and continue with this barrel as a 27″ one, rather than a new barrel.

Now about ballistics. With Winchester-Western brass one can safely get between 3400 and 3500 muzzle velocity. Elevation from 200 yards to 1000 it is four minutes flatter than 264 Win. using same match bullets. It is eight minutes flatter than the big 30 cal. Magnums using 190 and 200 grain Match King bullets. Windwise it requires just 2/3 the windage of the big thirties. Example, a 9 or 10 minute wind for the big thirties require only 6 for my 6.5. With Super Match 30-06, it requires just double the elevation and windage my rifle requires at 1000 yards. This is not just a guess or estimation. Joe Deckert and I have made many tests and have proven this. Also, Al Hoyer has made many exhaustive tests.

About the pitch of rifling—one would think that a 12″ twist at 3400 Ft. S. or 3400 R. P. Sec. it would be enough to stabilize the 139 grain bullet, but it doesn't work out that way for some reason. With this bullet over 1000 yards an 8″ twist seems to work best even in this large case. This gives the high rate of 5100 R. P. Sec. Winchester engineers had trouble for a couple years trying to properly stabilize the 140 grain bullet in their 264. I understand they finally settled on 9″ twist as a happy medium to handle both 140 and 100 grain bullets. Had they been concerned with only the 140 grain they no doubt would have gone to the 8″ twist. My first year at Perry with my first such rifle in 9″ twist, Al Hoyer thought the 9″ was too fast and suggested a 10″ or 12″. He later did just that with poor results. He finally tested an 8″ twist and was pleasantly surprised. At 1000 yards his groups shrunk almost in half from the 9″ and 10″ twists. Another clue; my son worked for Roy Weatherby on his 100 yard underground firing tunnel before the 264 Win. came out. He was experimenting with a 6.5 on the same case as his 257 and 270 magnum. The 12″ would not handle 140 grain bullets. Many showed oblong or keyholes even at 100 yards.

I will give my own thinking on the bullets and twist relative to 30 caliber and 6.5. If we scale the 10″ of the 30 caliber to 6.5 we come up with about 8½″. Now when the bullet hits the lands its angle of twist would be the same. Ordnance uses a similar system of scaling; for instance, the 50 caliber M. G., they used at first a lead filled jacketed bullet, an exact scale

Turn to page 19

RANDOM SHOTS

By Betty Summerall Duncan

***

(right to left) Capt. Lones W. Wigger, Jr., Pacific States Fall Round-Up Champion; runner-up M/Sgt. William E. Krilling and Henry Benson, raise mugs awarded them for firing 20-X possibles during the Pacific States Fall Round-Up. Photo by Carl Knight

They'll still be talking about the 1965 **Pacific States Fall Round-Up Smallbore Prone Championship** a decade from now. It was that kind of tournament—unforgettable . . . It might even be called a "tear jerker," in view of the effects of "Smogsville's" most irritating by-product, which fortunately became more subdued over the week-end of November 6-7 than on the previous day during practice. We all needed crying towels before there was occasion to "read 'em and weep."

It was more than the presence of **Olympic Champion** CAPT. LONES W. WIGGER, JR., and **National Smallbore Prone Champion** M/SGT. WILLIAM E. KRILLING. Their impact on the competitors was the quality which made this famous tournament memorable. The friendliness and good sportsmanship, which is their hallmark, served to elevate the sights of their fellow competitors.

Seven 1600's were fired in the wind with scope after points were dropped promiscuously with irons — suggesting that the incentive had been provided to revitalize the standard of western shooting . . . **Five National Open Champions** firing shoulder-to-shoulder charged the air with an enthusiasm which is healthy for, and too often lacking in, the shooting game.

By the time the second relay of Masters tackled the **Dewar** metallic, early morning calm was dissipated and conditions had taken effect. It was **Wigger** in the driver's seat, with a 400-33X win over(Krilling's 400-32X and Vic Auer's 400-30X — a subtle indication of things to come. Mike Allen and Phil Kemp, formerly of the Big Marine Team, also shot 400-30's . . . Following the **100-yd.** match, grumbling was the order of the day. It went to Expert **Bobby Lee Taylor,** ARADCOM AMTU, Ft. Carson, Colorado, with the only possible — X-count 28. He was trailed by Wigger—399-29, Krilling—399-25, and Auer—399-22, still in a huddle. . . Meanwhile, winds were rollicking—carefree and treacherous. A change of angle could mean anything. A 7 o'clock wind could take you to 7 o'clock **or**—it could land your shot at 1:00-2:00 o'clock. It could, however, boost it up to 10 o'clock in the 9-ring. Interesting? . . . **Tom Guerin** Creedmoored **Bill Krilling** with a 399-34X at 50-meters, followed by Bill Atkinson and Wigger with 399-31's . . . The 50-yd. match was **Wigger's** by 2 X's over Forrest O. Kline—400-35 to 400-33, with Auer and Atkinson's 400-32X a shade behind.

At the halfway mark the National Smallbore Position Champion was leading by 7 X's over the National Smallbore Prone Champion. Both considered themselves lucky to have weathered the conditions as well as they had.

Metallic Aggregate

Wigger	1598-128X
Krilling	1598-121X
Auer	1595-113X
Guerin	1593-116X
Larry Anderson	1593-113X
George Stidworthy	1593-93X
Atkinson	1592-120X
Richard T. Hanson (Jr.)	1592-108X
David W. Kimes, USA MTU	1592-86X

Expert

Bobby Lee Taylor	1595-109X
(Jr.) Anita True, Oxnard, Calif.	1589-99X

High Lady

Sharpshooter

(Jr.) Deborah Lederer, Arcadia, Calif.	1589-93X

Young, comparatively new shooters were turning in phenomenal scores for the conditions, while many Master shooters were in trouble. Whatever the explanation, more power to them.

It was a new **National Open Record** for **Bill Krilling** and **George Stidworthy** who teamed up to fire an 800-69X score in the 2-man team 50-meter any! . . . Note to the technical-minded—they are both members of the Calif. Rifle & Pistol Association . . . This was the record held by Herb Hollister and Ray Steele with 67 X's. By a quirk of fate, Hollister and Wigger had an identical 69X-count with a point down. (Wigger got a shot off too fast.)

***

November 7th was another day, another story. "I'm out to get you," was Herb Hollister's threat to Wigger. He wasn't kidding.

In the lull before the storm, **Michael H. Allen** released the brake and took the **Dewar** any from **Hollister's** grasp by a Creedmoor, 400-37X—ahead of Stidworthy's 400-35X, and Auer, Wigger, and Krilling's 400-34X . . . **Henry Benson** was overdue for a win and took the rough one, the **100-yd.**, with a beautiful 400-35X, flanked by Jim Hill's 34X, Bill Atkinson's 33, and Hollister's 32X . . . Sighted in for the 9 o'clock wind, if it shifted, the only thing to do was wait it out. It was the only prevailing or dependable condition. Any other could play havoc with elevation. Shooting in a strong 9 o'clock wind, an added bonus was a 12 o'clock crosswind. The odd combination assured a center X, if one were sighted in for it. . . . **Hollister** poured on the razzle dazzle with a 400-37X at **50-meters.** Four 35X possibles were in pursuit, as Benson, Stidworthy, Krilling, and Guerin were eyeing the finish line . . . **Wigger** snapped to attention to claim the **50-yd.**, Creedmooring **Auer** with a 400-38X. Hollister and Benson were 2X's behind . . .

That looks like a new National Reserve Record for Vic Auer, erasing the 400-37X which he and Wigger have held for so long that it is getting to be embarrassing for them both. Vic's Junior Record of 400-40X-20X, which still stands, is much more satisfying . . .

The beautiful Los Angeles Rifle & Revolver Club 1600 metallic arm brassard was awarded to Lones Wigger, Tom Guerin, and Bill Atkinson, new members of the Los Angeles Rifle & Revolver Club's "1600 Club."

Herb Hollister made good his warning to Wigger as he fired his **twelfth 1600** to win the **Any Sight Aggregate . . . Hank Benson** still reigns as the **1600 King,** as well as we can determine. This was #14 for him, and he still has Idaho license plate #1600. Who has a better right? . . **Vic Auer** figures ten 1600's, and **Bob Perkins** shot his seventh. The others had fired at least one previously. They ranked as follows:

Herb Hollister	1600-142X
Victor L. Auer	1600-136X
Henry W. Benson	1600-136X
Lones W. Wigger, Jr.	1600-134X
Thomas H. Guerin	1600-132X
William T. Atkinson	1600-125X
Robert E. Perkins	1600-119X

Also shooting were Stidworthy—1599-130X and Hill—1599-127X, who can usually be depended upon for a 1600. Hill lost his point at 50-yds.

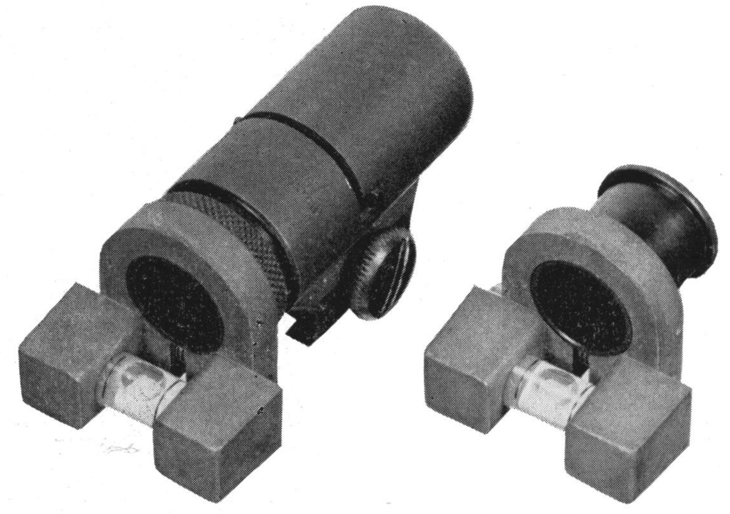
18-year-old Richard T. Hansen of West Covina, Calif. learned how it felt to be in 15th place with a 1598, as "Doggie" Kline, Krilling, Mike Allen, Larry Anderson, and LT. Jim Meger, USA MTU, eased in ahead of him. The way Rick is going, though, he'll soon close that 2-point gap.

Joe Egan, of San Diego, shot a nice 1596-111X, to win Expert Class honors over Ed Takahashi's 1595-120X and Bobby Taylor's 1595-107X . . . We remember **Jim** Gardiner, whose 1587-78X was high in the Sharpshooter class, as having a rifle almost larger than he was. Good to see the juniors still interested . . . Warren LeBlanc, Ft. Carson MTU, won't be a Marksman long. His 1594-108X was tops in his class.

The Los Angeles Rifle & Revolver Club takes particular pride in claiming the 1965 **National Collegiate Prone Champion, Larry Y. Anderson** of Reseda, Calif. His name is so similar to that of a very famous champion who is now studying in California and Larry's scores are such that there might be confusion, so—a bit of clarification seems in order. You'll be hearing more about Larry in a future issue of P. S. But, right now they seem to have forgotten about him back in Washington, where he is still classified as an Expert. We all know he is better than that; he entered as a Master by choice.

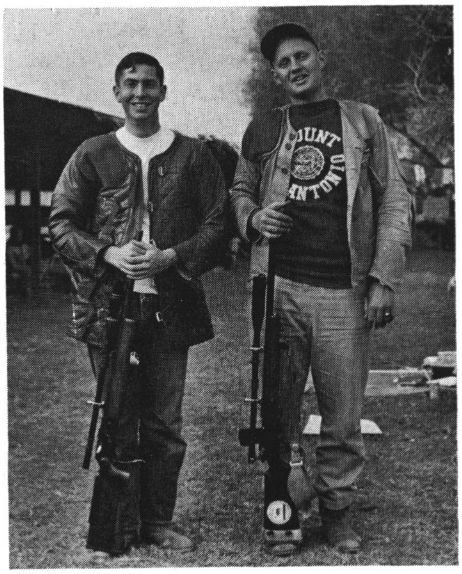
It must be stated that in taking the **Pacific States Fall Round-Up Championship** over a field of some 120, LONES W. WIGGER, JR., was a very gracious winner. It was never "in the bag" as far as he was concerned . . . **Bill Krilling,** in runner-up spot, was consistent throughout, but had a little trouble at 100-yds. No alibis, however; he didn't even challenge his close one . . .

Turn to page 16



SPIRIT-LEVEL
FRONT SIGHT ASSEMBLIES
Fits all Redfield International Series Front Sights
(State small bore or big bore — New or Old)
Adjustable for cant, No machine work necessary.
NOW ONLY **$7.50** POST PAID CAL. RES. ADD 4%
THE ARMORY, INC., 15844 Strathern St., Van Nuys, Calif.

ROY F. DUNLAP
GUNMAKER — IMPORTER
2319 Ft. Lowell Road
Tucson, Arizona 85719
Match rifles, stocks and accessories
Write for close-out sheet
on match rifles, etc.



(left) Larry Anderson, National Collegiate Champion, who placed 7th and Pacific States Fall Round-Up Junior Champion Richard Hansen. Photo by Carl Knight

National Bench Rest Shooters Association, Inc.

EASTERN REGION NBRSA MEMBERS

NOTE

The 1966 Winter Meeting of the Eastern Region NBRSA will be held on January 29 and 30, 1966 at the Sheraton Hotel and Motor Inn, 111 East Avenue, Rochester, New York. There will be no "Group Feeding"—eat when and where you wish. There are three restaurants in the hotel from which to choose. The hotel is a five minute walk from the center of the shopping district and right near the Eastman Theater.

Contact John Collins, 95 Devon Road, Rochester, N. Y. 14619 (Phone 716-Be 5-5098) for reservation and rate card, and brochure of Hotel. Reservation card should be mailed to reach John Collins before January 15, 1966.

REGARDING A HUNTER RIFLE PROGRAM

(The following letter regarding a Hunter Rifle program from John B. Sweany has been approved for publication by the NBRSA President—Ed.)

Dear Phil:

This will be mostly about the HUNTER program. We fired a match last Sunday with 53 shooters (Richmond, California). The rest were away buck hunting.

It seems the HUNTER program was started by two members of the CRPA (Calif. Rifle & Pistol Ass'n), the NRA, the NBRSA, the Richmond Club and what others? It appears they were George Fullmer and Len Shepherd, they were the first to arrange a match with some sort of rules and procedure to go by. From there it went to an Advisory Board of five members who drew up the present rules and procedure. The definition of equipment that was drawn had one minor change made and there it has stood satisfactory to every one who has fired the course. Of course suggestions have been offered but reasons were not hard to give showing these suggestions were not needed.

Any one can ADD something to any creation; that is easy and many times is harmful, but the person who can take something OUT and make it work better belongs in the realm of genius. We refuse to alter our rules until we see a needed benefit. This statement applies only to the rules as used by the Richmond Club and for them alone; we do not know what the National rules will be, we certainly HOPE they will be as pure and simple. We wish to find out if the Richmond Club was the first to operate a HUNTER program under fixed and successful rules. We are sure that many matches of a sort were fired long before we started but we want to know if they were ORGANIZED into a Hunter Gun program with rules and bulletins of results. We would like to hear from any Clubs who claim priority, their rules, success or failure.

NBRSA OFFICERS AND DIRECTORS FOR 1965

Brunon Boroszewski, President
Chestnut Ridge Road
Orchard Park, New York
Area Code 716, TX4-4433

EASTERN REGION
Dr. A. H. Garcelon (Director)
133 State Street
Augusta, Maine
MAyfair 2-1711

Gerald Arnold (Deputy)
R. D. #2
Gillett, Pa. 16925
Phone: Bently Creek 717 LY6-4085

George E. Kelbly (Deputy)
4 N. Hickin Ave.
Rittman, Ohio
Area Code 216, 925-1501

GULF COAST REGION
J. L. Bonner
P. O. Box 606
Area Code 817, 725-4146
Cross Plains, Texas 76443

MID-CONTINENT REGION
L. F. Carden (Vice-President)
5022 Waverly
Kansas City 4, Kansas
Area Code 913, AT9-6739

MISSISSIPPI VALLEY REGION
Arthur M. Freund
1038 Hornsby Avenue
St. Louis, Missouri 63147
Area Code 314, EV8-2718

NORTH CENTRAL REGION
Walt C. Siewert
Box 749
Custer, South Dakota

NORTHWEST REGION
Raymond G. Speer
925—7th Street
Lewiston, Idaho
Area Code 208, SH3-6135

SOUTHWEST REGION
John B. Sweany
4498 Silverado Trail N.
Calistoga, California 94515
WH2-6633

Secretary-Treasurer
Bernice E. McMullen
607 West Line Street
Minerva, Ohio 44657
Area Code 216, 868-6132

NBRSA MEMBERSHIP DUES:

Individual annual dues $6.00 (includes magazine subscription for membership term). Associate member (wife or husband, son or daughter under 18 years of age, of member in good standing—no magazine) $2.50. Life membership $75.00. Annual club affiliation fee $10.00.

The NBRSA has requested information and sketches of rules for such programs. Some one is not going to like this but such results can be disastrous. We are afraid that again and again and again someone will insist on rules made for HIM to win matches and exclude those who might win against him. We have seen far too much of this and the threat is very real. Look at the rules of numerous organizations that have been bent and twisted just for this purpose. The HUNTER MATCHES SHOULD BE WON OR LOST FOR SPORTSMANSHIP AND NOT FOR GREED. The NBRSA can make or miss with the rules they draw. It will take level heads working together for the good of the game and if they come up with rules to apply to the HUNTER GUN and KEEP them that way, they will succeed, it is just that simple.

There is an estimated 50 million gun owners in this USA. One per cent of that is 500,000, and one tenth per cent is 50,000. There must be 50,000 gun owners who will gladly join these matches. Inquiry from shooters who attended last Sunday's match stated they wanted to know these matches would keep going so they could come and shoot when they wanted to. They found the course of five 5-shot matches just right and they did not need to wake up next morning with sore muscles from position shooting because the BENCH did that for them. They HAVE all the equipment necessary to come right in and shoot without added expense and the fee to shoot is low and does not hurt.

A bad mistake was made in the South West Region when organization was started with the NBRSA for registered matches. Too fine a quality and too many trophies were given and the Club lost money on that first shoot, but the worst feature is that after that, the shooters expected even BETTER trophies to be given. They failed to give attendance so that could be done but even so it would not have been a wise move. It becomes "win for trophies" and not the glory of sportsmanship like the heroes of the ancient world contested with their life if necessary for a wreath of ivy but it was a wreath of sporting victory.

So we have TWO classes, the HUNTER class and the MASTER class according to score. The Masters are competing with Masters only and not against the vast majority who shoot the regular hunting gun as issued by the arms companies. The Masters have had new barrels, new stocks, new triggers put on their guns and those guns shoot better. Their owners are EXPERIMENTERS, and they are very definitely needed to show the way to better, more accurate arms.

The cardinal principle of the Richmond rules is the desire of its members to HELP shooters whose guns do not shoot so well as they should. There are always persons there who can and want to find points of improvement for these shooters. We find many shooters coming back for this purpose; it is a great asset for the cause. It is also the principle to keep these matches without change except when shown necessary by a great majority for the better. It is very discouraging to come to a match with equipment legal the last time you knew only to find your gun illegal by a change you did not know of; changes should only come after long notice and approval.

The RULE BOOK can be the making or the breaking of a very fine competitive program. The rules should be drawn by experienced competitors. We feel that they will be if the HUNTER program becomes National. There are plenty of very able persons in the NBRSA who can do this.

Phil, you are free to use this letter as you see fit. Remember that it is written by an OBSERVER of the HUNTER program and is his observation only, without permission, direction or authority from any organization or person. In this way he is free to express as he sees it, and he has seen all the matches since the first in 1963. This letter is not written with any idea of authority or direction, it is just—AN OBSERVER.

* * *

THE BEGINNER LOOKS BACK

Where does one start in this bench rest game? Where did you start? We are just finishing our first active season in the game, yet, if we look back, I guess we got our start about four years ago.

I spotted an ad for "Precision Shooting" and sent for a copy. Following a call to Brunon Boroszewski for an application blank, Stan and I accepted his invitation to the house to talk it over. He was a good salesman for the cause and we joined. This, despite getting a bit shook at the items he called "guns." Bench resting would cost us money—but it wouldn't be for a lot of fancy trappings. We quickly learned that money spent would be for quality. It was—and is—fun to kid Bruno but we also saw the workmanship that lies underneath the experimental designs. From Bruno that day, we learned that the NBRSA wasn't just a nation-wide club to shoot competition in and try to pick off some prizes—but it was an organization where it was up to each individual to give to the best of his capability to further "the developmnet and encouragement of extreme accuracy in rifles, ammunition, equipment and shooting methods." The fun is a natural by-product.

We watched our first matches at Dryden and met the gang. Ross Sherman was no stranger to us, for Stan had grown up in the Dryden area, and knew him a bit prior to this. However, this was where we first saw Ted Boughton, working out of the trunk of his car. He got so involved talking to us he almost missed his relay. It was Ted who gave Stan the first technical information we got—the whys and wherefores—what had been tried and failed and what currently was being tried. We didn't have a rifle then yet—except my 1895 Mauser with a Douglas target barrel in 243 cal. We did buy a sand bag from Ted and I wonder if he knew that with that first piece of equipment he launched us into the game.

We met Dan Hufnail, talked to him about bullets, and got a kick out of the inscription on his box—something like this—"These bullets have been through the same hole twice. Now it's up to you to make them go through a third time." It began to look like you not only bought custom guns but bullets, too. (Sorry, Dan, but my Sierras are shooting pretty good!)

Bob Stinehour I'll always remember as the guy who got me completely mixed up. I associate people with things—and I remember Bob's cowboy hat. It took me a couple years to realize that when people spoke of "Cowboy," they meant Lawrence Rucker and not Bob Stinehour. I wonder—did Bob have hat or head trouble? Seems to have swapped the hat for an airplane!

Dryden was where we first met Al Glendening, Arnold Banker, Lynn Hunt, Doc Glover and Cliff Carr. For quite a while we stood behind Cliff Carr's bench, catching a bit of the shade of his umbrella and watching the way this quiet overall-clad man took good scores and bad. Everyone else had an excuse for a blooper, but he just quietly waited for the next match. It was a good lesson.

Little did Lynn Hunt or I realize then that the day would come when we'd have good natured rivalry between ourselves. I really missed his not being next to me at the Nationals.

Ed Shilen was still in Dryden in those days and we went to see him—and learned a bit about a gunsmith—what services they did—and what it was maybe safe for a beginner to do himself.

We tried to talk Ross into building us a gun. "IF" he ever built more he'd remember us. Gee whiz—if he'd built me one then instead of 3½ years later—I bet I'd have a couple records by now! Isn't that what he means by "Superior" on the action?

After a couple years of hearing "Hart barrels" pretty consistently, I was beginning to envision a couple of stainless steel men, a bit like statues that you bow low before. You know what? Bob, Wally and Clyde are human and a heck of a lot of fun!

You know—you dream about doing something just so long, and finally you just go ahead and do it. Stan decided he wanted a 40X and Christmas was close, so I checked with Ross. Nope, but he did know Bob Hart had one. Following a phone call, I took off one weekend for Nescopeck to pick up the gun. In addition to enjoying the Hart's wonderful hospitality, I went up to the range. I walked around, down to the 100 yd. range and back and then sat on the firing line. Alone, on a crisp, cold fall day, I looked about and fell in love with Council Cup. I'll always enjoy shooting on other ranges—but if I put my 222 in heavy next year—it will be to take in a couple more matches at Council Cup.

In January we attended the Eastern Regional Meeting in Rochester—met the gang from Ohio as well as others we hadn't had the opportunity to meet before. We listened to bull session with Ray Biehler, Walt Astles, Paul Gottschall, Ed Shilen and Bill Purcell. Here we met the Hollidges and it was a thrill to meet "Ernest Stuhlschuter."

Stan shot his first match at Council Cup and Ross let me try out his gun. That did it and three weeks later I got my barreled action from Ross, and I was launched into fun and excitement!

Over Memorial weekend we went to Rochester to visit the Boughtons. There's no way to express the enjoyment we had that day. Arlene entertained us while we waited for Ted to return. After a terrific meal, we saw an album of snapshots—a capsule history of benchresting. We saw Ted's well equipped small shop and array of guns. This plus his interesting talk made us realize he not only is adept at his work but enjoys it as well. We went out to the Rochester range and found it can be a tricky one to shoot.

Stan shot a couple matches at Fassett, we both returned to Council Cup—this time being my first match—and then we went to the Nationals at Johnstown. It was fun—excitement—new friends made and many lessons learned.

Now it's time for dreaming again—of next summer and more matches. Stan talks of the winter shoots, but I'm a hot weather shooter. The time is coming to finish one stock, make a couple more, and get all cases trimmed and weighed and bullets spun.

It's fun to look ahead—but it's been fun looking back, too.

Jean Streeter

* * *

Bench Rest Match Reports

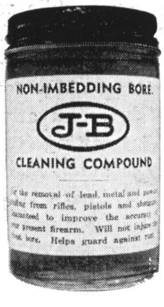
AUGUSTA, OHIO

John Minico, a first year NBRSA member from Fairmont, W. Va., won the Eastern Region Heavy Bench Rifle Championship which was fired at the Reed's Run Rifle Range, Augusta, Ohio, September 18 and 19. Shooting in the restricted-rests division, he was second at 100 yards with .4146, won the 200 yard stage with 3717 MOA and his winning championship aggregate was .3931 MOA. At 100 yards his smallest group was .273" and largest .531", while at 200 yards his smallest was .566" and largest .846". While seven of the Top-Ten in the Regional

Turn to page 12

PRECISION STAYNLESS STEEL MATCH TARGET BARRELS
Blanks in calibers .224, 6mm, 6.5mm, 7mm and .30 caliber available.
.22 rim fire blanks sold installed in customer's action only.
For prices and particulars, write:
Hart Rifle Barrels, Inc.
LaFayette, New York, R. D. #2 Telephone Tully, N. Y. Area 315 NX 6-5624

T. H. BOUGHTON—GUNSMITH
Complete, full time operation.
CUSTOM BENCH—VARMINT
AND SPORTERS
Built by a competitive shooter.
Match grade chambering with tools
by Keith Francis of Talent, Oregon.
N. R. A.—MEMBER—N. B. R. S. A.
Enclose stamp with inquiries.
410 Stone Road, Rochester, N. Y.
14616



NEW!
J-B NON-IMBEDDING
BORE CLEANING
COMPOUND—
Especially compounded for the removal of lead, metal and powder fouling from rifles, pistols, shotguns. Guaranteed to improve accuracy—will not harm finest bore.
2-OUNCE JAR
$1.50 POSTPAID
Pennsylvanians add 5%
State Tax
Jobbers & Dealer
Inquiries invited.
JIM BROBST
31 South Third Street
Hamburg, Penn. 19526

SPINTRU BULLETS
Write for prices
CRAWFORD H. HOLLIDGE
Cotuit Road
Marstons Mills, Mass. 02648

SAM BOND •
NEW PHILADELPHIA, OHIO
RETAIL & WHOLESALE
SHOOTING & HUNTING SUPPLIES
CARD FOR LIST

BENCH REST MATCH REPORTS

Championship aggregate shot .308 caliber rifles, Minico made the win shooting a 222 Magnum caliber.

Ernest Scafuri from Detroit led the un-restricted division shooters with a .4340 MOA aggregate, shooting a .222 caliber rifle.

Thirty-two shooters competed in the matches; twenty-two in the restricted rests division and ten in un-restricted.

The high ranking aggregates were:

Restricted Rest Division

	100 yd.	200 yd.	Grand
John Minico	.4146	.3717	.3931
Robert Hart	.3240	.4645	.3942
Homer L. Culver	.4174	.4345	.4259
Paul Gottschall	—	.3907	
Un-restricted Rest Division			
Ernest Scafuri	.3790	.4890	.4340
Cline Deere	.4634	.4140	.4387
R. Pickens	.3918	—	
Clyde Yockey	—	.4785	

Championship Top-Ten

	Agg.	Caliber
John Minico	.3931	222 Mag.
Robert Hart	.3942	308
H. L. Culver	.4259	308
Ernest Scafuri	.4340	222
Wm. S. Kappel	.4367	308
Cline Deere	.4387	308
R. Pickens	.4440	222½
Edith Culver	.4460	308
Clyde Yockey	.4530	308
Omar Rinehart	.4578	308

FASSETT, PENNSYLVANIA

(Editor's note: Our only information on this shoot is the match and aggregate statistical report. One can reasonably judge from this that wind conditions must have been pretty rough, especially for the 200 yard shooting.)

The entry was good at the registered Varmint and Sporter tournament at the South Creek Rod & Gun Club, Fassett, Pa. on October 2 and 3 and, in spite of apparent difficult shooting weather conditions, competition was keen. There were a total of 24 entries in Sporter class, 18 in Light Varmint and 38 in Heavy Varmint classes.

The high ranking aggregates were:

	100 yd.	200 yd.	Grand
SPORTER CLASS			
Robert Hart	.6150	.7432	.6791
Paul Gottschall	.6152	.7889	.7020
Gerald Arnold	.6202	.8111	.7156
Dave Hall	.5334	.9057	.7204
L. S. Rucker	.6760	.7767	.7263
A. M. Freund	.4962		
LIGHT VARMINT			
Omar Rinehart	.2844	.8203	.5523
M. H. Walker	.4158	.9316	.6737
Robert Hart	.3304	1.0368	.6836
L. S. Rucker	. —	.9036	
HEAVY VARMINT			
R. Hall	.4160	.6787	.5473
Wally Hart	.4762	.8411	.6586
Gerald Arnold	.4242	.9227	.6734
Paul Gottschall	.3982	.9613	.6797
M. H. Walker	.3694	1.0134	.6914
Lynn Hunt	.4878	.9200	.7039
W. J. Purcell	.5058	.9241	.7149
THREE CLASS AGGREGATE			
M. H. Walker			.6976
Robert Hart			.7611
L. S. Rucker			.7710
W. J. Purcell			.8381

Of the 19 who completed 200 yard aggregates in Sporter class, 11 had aggregates under 1 minute-of-angle. In Light Varmint, 4 of the 8 who completed 200 yard aggregates were less than 1 MOA. And of 28 completing Heavy Varmint 200 yd. aggregates only 9 were under 1 MOA.

RICHMOND, INDIANA

The final shoot of the season at the Old Trails Rifle & Pistol Club at Richmond, Indiana, was held on October 10th with nine shooters competing. Matches were for Heavy Bench Rifle, unrestricted rests class. The high ranking aggregates were:

	100 yd.	200 yd.	Grand
Ferris Pindell	.4238	.5008	.4623
S. Deen	.4490	.5630	.5060
I. E. Potter	.5708	.5547	.5627
L. White	.5168		

The top six of nine aggregates were fired with .30 caliber rifles.

Ferris Pindell comments: "Conditions were as usual very tricky. This is the toughest range I have ever shot on myself and my good friend Cline Deere agrees with me. The wind hardly ever blows long enough in one direction to get two shots off.

"There is hardly any doubt that the .30 cal. is best at 200 yards when it really gets rough, but I still think the .22 cal. will stay in there at 100 yards in the hands of a good doper. In fact it has always been my firm belief that the 100 yard aggregate really shows up the rifle and ammunition, but the 200 yard brings out the doping ability."

KANSAS CITY, KANSAS

The final registered shoot for the season was fired at the Mill Creek Rifle Club, Kansas City, Saturday night, October 16th with 11 shooters competing in Bench Rifle, unrestricted rests class.

In spite of a tricky wind for night shooting only one shooter, who was firing his first heavy gun match and with a borrowed rifle, had a grand aggregate over .500".

Maj. Rick Hornbeck, who was convalescing from a back operation and still with some pain, made the trip from Wichita and won the grand aggregate. His teen-age daughter came along to do his loading and equipment carrying.

The matches start with a warm-up match at 100 yards about 4:30 P. M. and continue under lights.

The high ranking aggregates were:

	100 yd.	200 yd.	Grand
Rick Hornbeck	.3734	.3925	.3829
Walt Berger	.3340	.4321	.3830
L. F. Carden	.3350	.4370	.3860
H. Baucher	.3668	.4302	.3986

Small group at 100 yards was fired by Rick Hornbeck (.211") and at 200 yards by Bob Stultz (.587").

Hornbeck shot a 22X45 cal. in Hart barrel on B&L action, gunsmithed by Larry Englebrecht of Wichita, with B&L 6-24 scope and his own 53 gr. bullets. Berger and Carden shot 222 cal. rifles with Hart barrels on Baucher actions. Berger used a Unertl 24X scope and his own 52 grain bullet, while Carden used a Lyman 20X scope and his own 50 grain bullets made in B&A dies. Baucher shot a 22 in Hart barrel on his own action, used a Unertl 32X scope and his own bullets.

All used .22 cal. rifles, 9 in Hart and 2 in Douglas barrels, 7 of them on Baucher actions. H. G. Baucher, the Kansas City gunsmith, made 9 of the rifles. Besides Hornbeck's rifle by Engelbrecht, Dixon Herman shot a Taylor & Robbins built rifle in .219 Don cal. Four used Sierra 53 grain bullets, one the Remington 50 grain and six their own hand-made bullets. Ten used RWS primers and one used Federal.

CANTON, OHIO

At the Canton-McKinley Rifle Club's 200 yard Varmint rifle shoot on October 9 and 10 shooting conditions are reported to have been "not a bit good." Of the 21 shooters only Clem Mervis from Lorain, Ohio, was able to shoot a possible 250 aggregate score (.5338 MOA group aggregate) but it took a possible 50 score to get in the top five of any fired match. Gottschall, Bidwell, R. Casper and Mangon shot 249 aggregate scores.

At the next to last shoot for the season on October 23 and 24 there were again 21 competitors and despite the cold, gusty wind and rain they did some very excellent shooting. Trester (250-20x), Anderson (250-15x) and Modock (250-13x) led the field. Rinehart had 249-14x and from there there were six 248 scores followed by three 247's.

Trester and Modock shot the 6mm Int. caliber in Douglas barrels on Mauser actions, while Anderson shot a 222½ in Hart barrel and action.

EDITOR'S COMMENT: At the start of these Varmint rifle matches at Canton, some three years or so ago, most of the local and near-by shooters who started their bench rest competition here were using their varmint hunting rifles and the experienced bench shooters with their custom built competition rifles who attended had an easy time winning most of the aggregate places. But now things have changed and the early winners now have to really work for anything they win. Experience and better equipment have changed the former also-rans into tough competitors.

At the start of these matches only score was considered for ranking but since holding some registered shoots, with group aggregates required, it has become common practice to list both score and group aggregates. In the beginning of this practice it was quite common for an aggregate score winner to have a group aggregate considerably larger than someone with a lower score. That has now also changed and recently the score winner is usually, but not always, the small group winner as well.

The Remington 40X rifles are most popular with the newer shooters in these matches, and some of the longer experienced shooters have changed to them as well. At the late October shoot, 13 of 20 rifles listed were Remington 40X.

If officials of any other clubs wish to get more information about these popular matches, with details of rules, targets, operating procedure, etc., R. H. Johnson, 3118 11th St. S. W., Canton, Ohio, is the secretary of the Canton-McKinley Rifle Club.

WINCHESTER MODEL 70 CAL. 225 VARMINT RIFLE

I have just finished giving a Winchester Model 70 Varmint rifle in 225 Win. caliber (supplied by the manufacturer) a pretty thorough shooting test workout. I have been quite pleased with the rifle and its performance.

The sample rifle weighs 9½ pounds without sights. The 24 inch barrel is .785 inch in diameter at the muzzle. The rifle comes equipped with bases for target scope mounts (no metallic sights). The top of the barrel at the muzzle is drilled and tapped for attaching a scope-type base to accommodate a target-type front sight. The receiver is drilled and tapped on the side for attaching a receiver sight, and the receiver bridge is also drilled and tapped for attaching a scope base. The target-scope mount base on the receiver ring could be removed and substituted with a base for a fixed-mount hunting type scope, should that type of scope be desired.

The Monte Carlo stock is rather slim. In fact, with the channel for the heavy barrel in the forearm it is in my opinion too slim in that area; the forearm can be moved up, down or side-wise with a very moderate finger pressure. The barrel is intended to be free-floating. On this sample it was quite free on the left side, bottom and from the receiver about half the length of the forearm on the right side but wood was lightly bearing against the barrel at the forward part of the forearm (that could be easily remedied but I shot the rifle as it was received). Wood in this sample had a subdued pleasing figure. Checkering on the pistol grip and forearm is apparently of the current stamped type—more decorative than functional. The stock has swivels for a one inch shooting sling.

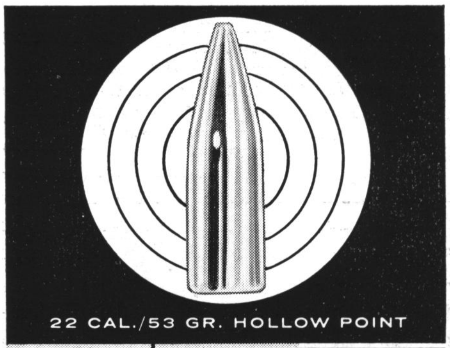
This is the first of the current Model 70 actions that I have had an opportunity to examine closely or use. I certainly could find no fault with the functioning of the sample rifle. In fact, the bolt travel is the "slickest" of any turn-bolt repeating rifle I have ever used—not excepting the famed old Krag. With the rifle in horizontal position and the bolt drawn fully to the rear, raising the butt no more than approximately 20 degrees the bolt will slide forward of its own weight to the turn-down point.

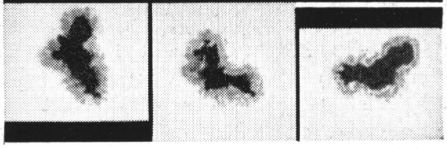
The bolt face is recessed with the now conventional spring loaded plunger type ejector. The extracter is set in the forward face of the right-hand or bottom locking lug—this is a system I have never seen before but it functioned faultlessly for the shooting I did. The locking lugs appear to bear evenly and across the full width of their face.

In loading the magazine with the 225 cartridges it is necessary to make sure that the rim of each cartridge is ahead of

Turn to page 14

This is the NEW
HORNADY
22 CALIBER
MATCH
BULLET





TYPICAL TEST GROUPS:
5 Shots at 100 Yards. Targets Measure ¼" or Smaller. Rifles: Rem. 40 XB's in 222 and 22/250

meant for COMPETITION
made for WINNING

Our new 22 Cal./53 Gr. Match shoots like a winner . . . precisely, consistently, dependably.

The three groups shown above—each 5 shots at 100 yards—measure on or under one quarter of an inch. They are typical of the production test groups we routinely shoot with these new Hornadys.

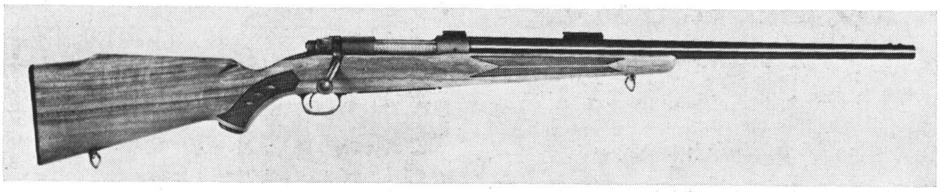
The .224 caliber Hornady benchrest bullet has been designed strictly for accuracy . . . and extra care (and many extra operations) in manufacturing, plus continuous production testing assures this accuracy at all times.

Our new Match 22 will deliver consistently outstanding target results. We believe you'll find it superior to any benchrest 22 you've yet tried. At your dealers.

$3.85 per 100

For your most important shooting,
trust HORNADYS!

Bullets for handloading—send for list
Hornady
BULLETS
HORNADY MFG. CO. • DEPT. PS • GRAND ISLAND, NEBR.



The Winchester Model 70 Varmint rifle

the one underneath (this "semi-rimmed" cartridge seems to me to be mis-named).

SHOOTING-WISE: I shot 52 five-shot groups at 100 yards, 20 with factory loads and 32 with re-loads, in six shooting sessions. This included every shot fired; every shooting session started with a five shot group from the clean, cold barrel. The scope used was a 1¼ inch 10X Unertl. Weather conditions for two shooting sessions were nearly ideal but for the other four there was some wind and light changes to contend with. Shooting was from bench rest, off sand bags.

The over-all average for the 52 five-shot groups was 1.179 inch. The average for the 20 groups with the factory cartridges was 1.389 inch and for the 32 groups with reloads it was 1.050 inch. Of the 20 groups with factory loads, three were under one inch, the smallest being .625". Three were over two inches, the largest being 2.230 inches. With the reloads, 16 of the groups were under and 16 were over one inch, the smallest being .415" (only 3 under ½ inch) and the largest 2.100" (the only over 2" group).

Of the over-one-inch groups, 5 with factory loads and 11 with the reloads had 4 shots in a well under an inch cluster and 1 "stray" widening the group. There was no pattern for the dispersion of the strays; they were in all directions and occurred with all loads tried. My "guess" is that the forearm wood bearing against the barrel on one side may have been partly responsible for the "strays," but that is only a guess and not to be considered as anything else.

An early report on the 225 Winchester cartridge in one shooting magazine tended to give the impression that the cartridge was difficult to reload for accuracy. My own first experience at reloading the cartridge was not very successful but there were circumstances of that experience that I considered abnormal and I kept an open mind pending further experience. My present experience convinces me that the 225 Winchester is no more difficult to reload for accuracy than any other cartridge. In fact, with ordinary care, it does not seem to be at all a "fussy" cartridge to reload for good accuracy.

I did not use any big variety of loads in my rather brief testing. I only used one powder, Du Pont IMR 4064, in two charge weights, 30 and 32 grains. I did use four different bullets of three different weights and three different brands of primers. I first tried 30 grains of 4064 with my own home-made bullets in 52 and 55 gr. weights. I then went to 32 grains of 4064 and accuracy with both of my home-made bullets improved appreciably. Four groups with some Speer 52 gr. match bullets that I've had on hand for several years averaged .837". The four-group average for my own 55 gr. bullets was .887 and for the 52 gr., .855. Four groups with some old style Hornady 50 gr. Spire Point bullets averaged 1.242" with two of the over-one-inch groups having four shots in less than an inch but with one wandering stray; small 5-shot group was .885".

I would consider the accuracy of this "out-of-the-box" rifle to be very good. I believe that a very little minor "tuning" would improve accuracy and at least minimize the tendency for "stray shots."

P. H. T.

• • •

THE SAVAGE MODEL 110 RIFLE IN 22/250 CALIBER

The SAVAGE Model 110MC bolt action rifle which is chambered for the Remington 22/250 cartridge is designed specifically for use as a relatively light weight (7½ lbs. without sight) Varmint rifle. There are no metallic sights on the rifle and no cuts or other provision for installing such sights on the barrel. The sample rifle had bases installed on the receiver to accommodate the mounting of a hunting type scope sight in the Savage top mounts. Bases to accommodate other top mounts could easily be substituted if desired.

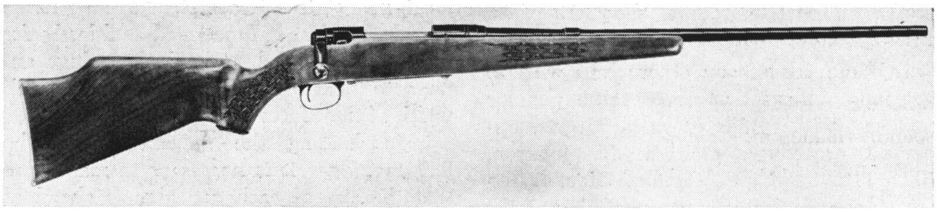
The 24 inch barrel is .565 inch outside diameter at the muzzle. The barrel does have the enlarged bulge or ring on which the open rear sight is usually located but without any cut on top for a sight. The Monte Carlo stock is well proportioned, being somewhat bulkier in the forearm than an older 110 sporter that I have, which provides desirable stiffness without being ungainly. With one minor exception on the sample rifle, the barrel is free from the stock wood in the forearm channel from just forward of the receiver to approximately one inch from the forearm tip, where the wood contacts the barrel to give some upward pressure. The one exception on the sample rifle is at the enlarged ring section of the barrel, where the wood at top of stock does bear tightly against the metal on the left side only. (This is minor because the wood could easily be relieved but the sample rifle was shot as received without any alterations.) The bedding of the action appears to be very good.

The bolt face is now recessed and about ¼ inch of the bolt forward of the locking lugs is enclosed within the breech of the barrel. The hook extractor is located under one edge of the right hand (lower) locking lug but not in a manner to weaken the lug. The ejector is located in the bottom of the receiver and is pressed down against spring compression by the bolt in its forward travel. While the trigger pull on the sample rifle is heavier than I personally like, it is without any creep. Functioning of the rifle action was faultless.

THE SHOOTING: All shooting was at 100 yards from bench rest off sand bags, in six shooting sessions. Weather conditions for the shooting were very good on two days but only fair with some wind and light changes on the other four. Scope used was a Lyman All-American 10X. Except for one 10-shot group with factory ammo, all shooting was in 5-shot groups. No warmers or foulers were used at the beginning of any shooting session—all shots were "for record."

The over-all average for six 5-shot groups with factory ammo and thirty-two with handloads was 1.439 inch. Average for the 6 groups with factory ammo was 1.800 inch (the 10-shot group was 2.335" with 8 in 1.800"). Average for 32 groups with all handloads tried with 50 and 55 gr. bullets was 1.371 inch. Three of the groups with factory loads were over 2 inches, the largest being 2.225—smallest group was 1.120". Only 2 of the 32 groups with handloads was over 2 inches and the shooter was responsible for one wide shot in each of those—smallest group with handloads was .625". Only 6 groups with the handloads were under an inch but 15 others had clusters of 4 shots under an inch with 1 stray enlarging the group.

I used charges of 30, 32 and 34 grains of 4064 powder with 55 grain home-made bullets and there was no significant differ-



The Savage Model 110MC rifle as chambered for the 22/250 cartridge.

Max-Fire®

CENTER FIRE RIFLE & PISTOL

PRIMERS

FOR THE DISCRIMINATING RELOADER WHO INSISTS ON HIGHEST QUALITY

by ALCAN

- SMALL RIFLE
- LARGE RIFLE
- SMALL PISTOL
- LARGE PISTOL

"MAX-FIRE" rifle and pistol primers were developed specifically for "RELOADING" quality center fire metallic ammunition. Alcan's production methods, precision machinery, and modern priming mixture is combined to manufacture the superior quality "MAX-FIRE" rifle and pistol primers. Satisfy yourself — insist on "MAX-FIRE" primers!

ALCAN Company, Inc.
Seminary Road - Alton, Illinois

ence in accuracy with these three charges, average for 16 groups was 1.276". One series of 4 groups with 34 grains 4064 and some 50 grain homemade bullets in .705" jackets averaged 1.083" but this series included the smallest group fired with the rifle, the other 3 groups being comparable with those using the 55 grain bullets. With the exception of 2 large groups for which the shooter was largely responsible, charges of 32 and 34 grains of 3031 powder gave accuracy comparable with the loads charged with 4064 powder. Some old style Hornady 50 grain Spire Point soft point bullets with 34 grains 4064 gave a four group average of 1.408", two of the groups having the cluster of four shots in under an inch.

While the accuracy obtained in the limited amount of shooting with this relatively light weight, slim barreled, "out-of-the-box" production rifle is not particularly impressive, I would consider it reasonably adequate for the needs of the average varmint hunter, as is. I would feel reasonably sure that further experimenting with hand loads would turn up some of excellent average accuracy. The rifle is a soundly made, nice appearing, nice handling gun, at a very reasonable cost.

P. H. T.

HANDLOADERS

Stop Guessing Pressure and Velocity. Compute them with the Powley psi Calculator and the Powley Computer for Handloaders.

Powley Computer for Handloaders	**$3.50**
Powley psi Calculator	**2.00**
Both in one Package for	**5.00**

To calculate the path of your bullet you also need

Powley's High Velocity Trajectory Chart	**$18.00**

And the sophisticated ballistician will need

Powley PMAX Pressure Gauge for Large Rifles	**$49.00**
100 Pellets for Above	**$16.50**

HUTTON RIFLE RANCH
1043 Greenleaf Canyon Road,
Topanga, Calif.

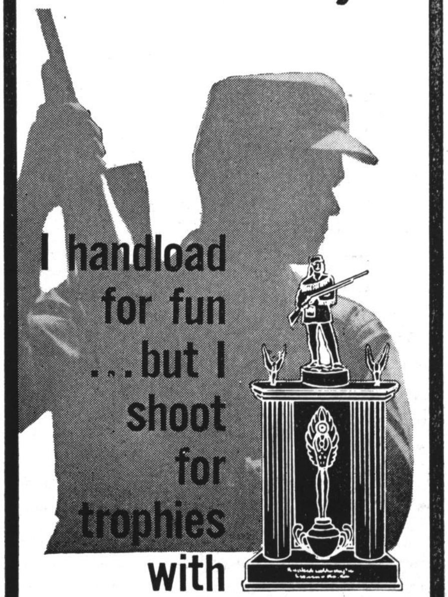
CLEANED YOUR GUNS RECENTLY?

Don't let your guns wear out off season. Dust, corrosion, moisture in the air are the greatest enemies of accuracy and long firearms usefulness.

SEND FOR FREE GUN CLEANING GUIDE

FRANK A. HOPPE, INC.
N. Eighth St., Phila. 33, Penna.

The **norma**® **man** says..



NORMA components

Game trophies or match trophies — either kind is more satisfying when you nail them with ammo you've loaded to your own personal preferences.

Whatever type of game or target you're aiming for, choose from **Norma** components — because the choices you want are **there:**

BULLETS—Diameters from .224" to .375" for rifles—including the great 7x61, .308 and .358 **Norma** Magnums. Handgun calibers from .22 to .44.

POWDERS—The famous **Norma** "200" series. Ranges from ultra-slow-burning 205 for highest velocities with larger cases ... to fast-burning 200 for light loads in small cases.

CASES—Virgin brass cases in world's most wanted calibers.

Yes, handload for fun ... but look for trophies ... when you use **Norma** components!

LOOK FOR **NORMA** components at your ammunition dealer's.

LOOK TO **NORMA** for leadership in the world's most advanced line of:

Precision Bullets • Unprimed Virgin Brass Cases • Smokeless Powders • Loaded Ammunition

Want more handloading info? Send 25¢ for your copy of the new "GUN BUG'S GUIDE," Dept. P.S. 12

norma-precision
Div. of General Sporting Goods Corp.
SOUTH LANSING, NEW YORK
In Canada: Globe Firearms Ltd., Ottawa
George L. McNicol Ltd., Vancouver

10-X NEW LEATHER RIFLEMAN'S COAT

Here's the coat that's breaking national records in both small bore and big bore shooting. Strap yourself into the steadiest position ever experienced in your life. An amazing coat, custom made to your measurements. Ask your sporting goods dealer.

Write for FREE Catalog
10-X MANUFACTURING CO.
114 S.W. Third St.
Des Moines, Iowa

BENCH REST AND VARMINT SHOOTERS

"My Special" Sierra .30 caliber Jackets (described in August 1961 issue) available in 1.050", 1.150" & 1.250" lengths @ $16.00 per M plus postage for 7 lbs.

6m/m Sierra Jackets in .827" & .937" @ $12.50 per M postpaid.

22 caliber Sierra Jackets in .705" @ $10.00 per M postpaid.

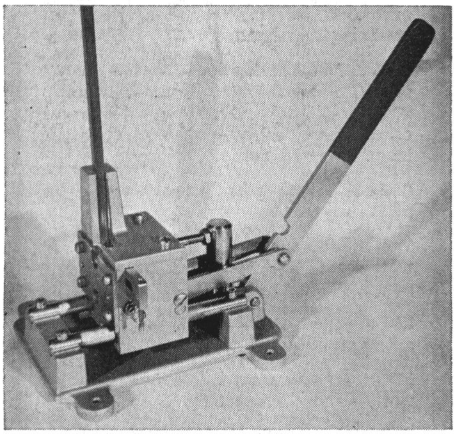
3/16", .240" & 5/16" lead wire in 25 lb. spools @ $9.00 FOB Rochester

KENRU Precision Soft Swaged 22 caliber Bullets .38 cal. & .44 cal. Half-Jackets @ $7.50 & $9.00 per M.

Please enclose payment with all orders, overpayment promptly refunded. Also send self-addressed envelope, or return postage, with all inquiries. (member NRA & NBRSA)

KENRU RELOADING SERVICE
166 Normandy Ave.
Rochester, New York 14619

A PRECISION CARTRIDGE
PRIMING TOOL
WITH "MECHANICAL" PRIMER FEED



A rapid, efficient tool that will automatically insert primers with great accuracy in both rifle and pistol cases.

Each shell holder will handle two sizes of case heads.

Priced at $28.80 P. P. which includes shell holder, two priming rods (large and small), magazine tube, loading tube, sorting tray, instructions.

Standard shell holder for .38 Spl. and .30-06. Extra shell holders (two cal.) for $2.00.

This cartridge priming tool allows you to clean and to inspect the all important primer pocket YET SPEND NO MORE TIME AT THE LOADING BENCH.

THE GUN CLINIC
81 Kale St. Mahtomedi 15, Minn.

Random Shots

Grand Aggregate—	
Wigger	3198-261X
Krilling	3196-248X
Auer	3195-249X
Guerin	3193-248X
Bill Atkinson	3192-245X
Stidworthy	3192-223X
Larry Anderson	3191-231X
Perkins	3191-218X
Hollister	3190-236X
Benson	3190-236X
Hill	3190-230X
High Junior—	
Richard T. Hansen	3190-225X
Experts:	
Bobby Lee Taylor	3190-216X
Ed Takahashi	3177-197X
High Lady—	
Susan Meek (Jr.), Arcadia, Calif.	3172-194X
SS:	
Deborah Lederer, Arcadia, Calif.	3169-177X
MKs	
Warren J. LeBlanc	3172-190X
Hi Unclassified	
Jack E. Bell, Ft. Carson MTU	3162-188X

Jimmy Price is doing a fine job with the shooters at Ft. Carson.

***

In lieu of conducting a formal Shooting Clinic due to the briefness of daylight hours, Wigger and Krilling spent their time between relays answering competitors' questions, assisting in position problems for both junior and senior shooters, and even adjusting a trigger or two. The USA MTU at Fort Benning, Georgia, could not have selected a better team of good-will emissaries than this pair of champions, ably supported by Jim Meger and Dave Kimes.

For the record—they were using their personal rifles and equipment.

****

The **Roseland, New Jersey, 15th Anniversary Prone Tournament,** fired at O'Hare's Range on September 26th, had a capacity turn-out. It was the only outdoor prone tournament which actually materialized this season in the state which has consistently produced top-flight smallbore shooters since Sea Girt was in its hey-day. While other states recognize state champions, the top outdoor shooters in New Jersey for 1965 are the winners at Roseland's Spring Position—Frank Tetrault—and Fall Prone tournaments.

(There are times when even hard-working and well-meaning high power or pistol shooters fail in their efforts at conducting a tournament, if that tournament happens to be a smallbore state championship. More than one state association has faced the realization that in order to enlist the cooperation of smallbore shooters, those shooters must be given a voice in smallbore activities . . . A smoking-of-the-peace-pipe over the council table could result in closer harmony at a time when we can ill-afford division. Also, a satisfactory state championship program could be planned for next year—one which would not be second cousin to a "turkey shoot.")

At Roseland, on the above date, a happy atmosphere prevailed. Weather was excellent, around 60 degrees, with conditions about as good as have ever been seen at the O'Hare Range. With the sun behind the targets and low at this time of year at 9:00 a. m., the extremly poor light was anticipated by scheduling the two scope matches first.

The 50-yd. any produced 20 possibles topped by R. W. Blatchley, William P. Schweitzer, Joseph Carten, and Serge Fedoroff with 400-36's . . . Shooting for X's, 1965 Dewar Team member **Joe Barnes, Jr.** took the 50-meter any on the reduced target with a pile of them—400-36X, over Experts S. LaPointe—400-33X, A. Pjura, Jr.—400-32X, and Rosemary McDaniel of Conn.—400-32X.

It was an all-star cast as experience told the story in the Dewar metallic, when wind became gusty and a bit tricky. Internationally-known **Bill Schweitzer,** Rans Triggs, Barnes, and Jack O'Hare scored 399-33X, 32X, 31X, and 24X, respectively. With improved light, many points could have been saved, possibly, by waiting out the gusts.

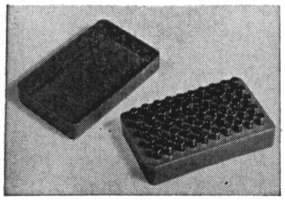
Close competition is a healthy sign. It keeps a tournament interesting. And, with the metallic matches last, no one coasted home.

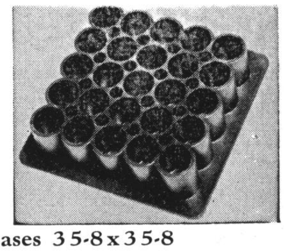
Going into the final stage at 100-yds. iron, Barnes with 3 down led Schweitzer by 6 X's as Triggs, O'Hare, and Frank Boyd were neck-and-neck, a point behind. The pressure was on as Triggs came through with a 200, Schweitzer—199, Barnes and Boyd—198, as O'Hare lost 3 (points). That shifted the standings around a bit . . . Match winner was Expert **D. D. McNamara**—399-25X, followed by Triggs' 399-21X, and Sharpshooter F. Scielzo—399-20X.

Those who **ever** reach the top are all too few. **Bill Schweitzer**—a teammate of my father's on the 1937 Pershing Trophy Team (the next to last team which fired at Bisley), and winner at Bisley at least once—returned to his native state and with a remarkable burst of his old brand of skill managed to defeat **Ransford Triggs** who, like himself, became a champion and continued to verify it year after year. Schweitzer's 1596-125X over Triggs' 1596-113X represents a victory over some formidable competitors . . . As Ken Stannard expressed it, "For a competitor who does not do the amount of shooting as his contemporaries, this is quite an achievement. Schweitzer certainly showed us some fine shooting and sportsmanship while at our range, and we welcome him back hopefully in the near future."

Trailing Schweitzer and Triggs was Joe Barnes who, with 1595-128X, was high on X's. Master Class awards went to Boyd—1594-111X, Bob Wilkinson—1594-98X, and O'Hare—1593-113X.

Winifred Carr eased out another





NEW!
"OSTER" Plastic Products

Cartridge Box
.22 Lr. Cal.

Loading Block
(Range Block)

Capacity—50 .22 LR Cart.
Size—4¾x3x1—Wt. 3 oz.
For the 'Plinker'—Target Shooter
Price—$1.00 Ppd

Capacity—25 cases 35-8x35-8
Sizes—Regular and Magnum
(State which when ordering)
Price 39c —3 for $1.00 Ppd.

LLANERCH GUN SHOP, Dept. PS Upper Darby, Pa. 19083 Dealers Inquire

Winners at the Roseland (N. J.) 15th Anniversary Smallbore Prone Tournament. (Left to right) Joseph Barnes, Jr., third place, Ransford Triggs, second place, and William Schweitzer, over-all Champion.

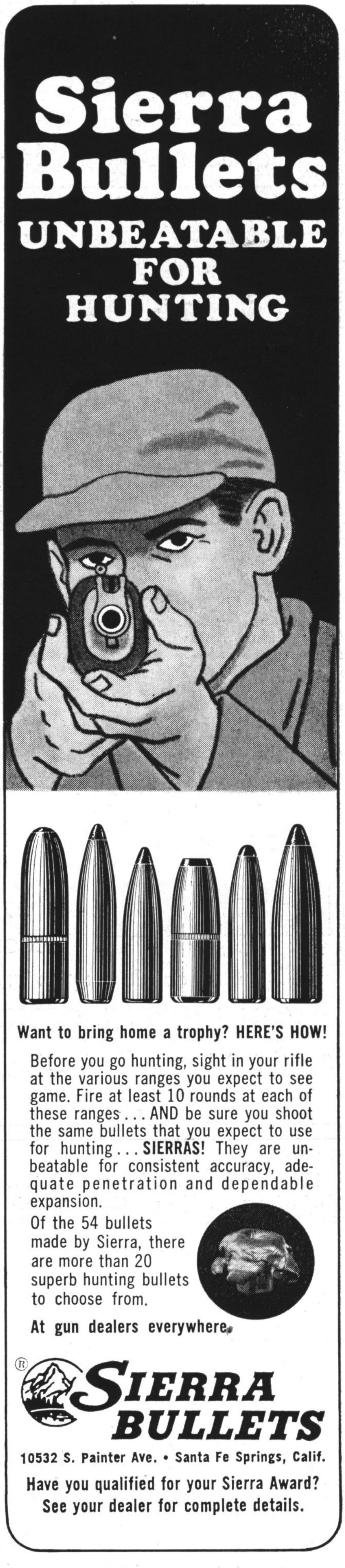
Winners at 1965 New Jersey Smallbore Junior Prone Championship. Left to right, Donna Burton, high sub-junior, Danny McNamara, open junior champion, and Linda Ritchie, woman champion.

Randle Team member, Janie Svab, for High Lady—1588-95X to 1587-97X. Winnie has made a gratifying recovery since suffering four broken ribs and a collapsed lung in June.

High Junior was **Albert Pjura, Jr.**, of Stratford, Conn., scoring 1589-102X . . . J. J. Maher out-X'd LaPointe 1591-108X to 1591-104X for Expert honors, while Richard Allorto isn't long for the Sharpshooter class with scores such as his 1592-83X . . . L. G. Ritchie's 1584-90X was good for Hi Mks.

***

Turn to page 18



Sierra Bullets
UNBEATABLE FOR HUNTING

Want to bring home a trophy? HERE'S HOW!

Before you go hunting, sight in your rifle at the various ranges you expect to see game. Fire at least 10 rounds at each of these ranges . . . AND be sure you shoot the same bullets that you expect to use for hunting . . . SIERRAS! They are unbeatable for consistent accuracy, adequate penetration and dependable expansion.

Of the 54 bullets made by Sierra, there are more than 20 superb hunting bullets to choose from.

At gun dealers everywhere.

SIERRA BULLETS
10532 S. Painter Ave. • Santa Fe Springs, Calif.

Have you qualified for your Sierra Award? See your dealer for complete details.

DON'T MISS A SINGLE ISSUE OF
PRECISION SHOOTING
SUBSCRIBE NOW WITH THIS HANDY
COUPON — OR ON YOUR OWN STATIONERY

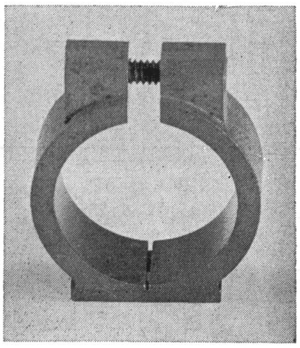
SUBSCRIPTION FORM FOR PRECISION SHOOTING
LYNDONVILLE, VERMONT 05851

Please enter my subscription for the period indicated below

☐ TWO years $8.00 ☐ ONE year $4.50
☐ Payment enclosed ☐ Please bill me

Name ....
Address ....
City .... State ....

"MAGNUM CLAMP"
for ¾", ⅞" and 1" tube sizes.



Features:
- Wider and Heavier Construction
- Positive Tightening
- Easy Installation
- Attractive Appearance

SUGGESTED RETAIL PRICE $4.75—(Any Size).

Our catalog upon request
JOHN UNERTL OPTICAL CO.
3551-55 East St. Pittsburgh, Pa. 15214

X-erps—

From the River Bend Gun Club "Bullet-In" (Georgia, suh)—: **Carbine, M-1—** "This little gun ain't easy—but it's fun. Since almost all of you own one, why not give it a go!"

A motley crew of carbineros showed up once more to try to qualify under the new NRA program and, of course, to beat the heck out of each other for awards. After the rain of brass and cuss words had settled, it came out thusly:

Winner—Dick Stewart (me)	517
2nd—Ray Grim (the teeth gnasher)	501
3rd—Inman Brandon (a fine broth of a lad)	485

The "other guys" were:

Norm Franklin (my sights slipped)	450
Dr. Hathcock (oops!)	300
Walt Bayemore (Boy, that was close)	481
Don Baldwin (I'm good, for a kid)	466
Kelsie Baldwin (Wish I could beat that kid)	457
Bobby Wardle (Something in my eye) (50 yds. only)	231

Unlimited Bench Rest

A small but elite crew showed up to try the fly busters, and fly bust they did.

Winner—Tom Gunston (again!)	Avg. .3765
Smallest group—Tom Gunston (natch)	.239
Second—Dick Stewart (Bad load)	Avg. .510
Third—Jim Adcock (Dern wasp)	Avg. .539
Fourth—F. Fife (weeds in the way)	Avg. .540
Fifth—Val Adcock (I'm gooder, usually)	.598
Sixth—Chas. Hamby (This group used to win)	Avg. . . . .?

My message to old friend:—Sorry, Charlie; it failed to print on the paper . . . How refreshing to find a statistician with a sense of humor!

****

National International 300-Meter Champion Bill Krilling broke in his brand-new 300-meter rifle during the **California State International Championships** at Richmond on October 23-24. . . . Remember what happened to him at Wiesbaden when a round blew up in the chamber of his old rifle? . . . Bill discovered that the new barrel is longer, which placed the hook too high. He utilized half a dozen sighters to re-adjust it, then went on to win the 300-meter with a 575 . . . In second place with 573 was S/Sgt. Raymond L. Lewis, USAF Int'l Team, followed by Wigger and Gary Anderson's 567's.

The smallbore 3-position match starred **Olympic gold medalists Wigger** and **Anderson,** with the World Record-holder for this course of fire edging the 300-meter World Record-holder by a point—1157 to 1156. Lewis was third with 1135. Krilling never did get warmed up . . . It clinched the **California State Int'l** title for **Capt. Lones W. Wigger, Jr.,** National Smallbore Position Champion, who aggregated 1157 over **Gary Anderson's** 1156. Again, Ray Lewis was third, scoring 1708; Krilling, fourth, with 1694. Best **Civilian** score was **Gordon Taras'** 1676.

****

It was a photo finish at the **Pennsylvania State Smallbore Prone Matches** as **Dr. Theodore Charlton** Creedmoored former National Champion **J. Kenneth Johnson** as each came through with an outstanding 3197-261X score!!! . . . Pennsylvania's State Postal Team total of 3991-283X looks like a probable winner, and they can depend upon Charlie Morris to assure that it doesn't get lost en route to headquarters (the fate of a previous score).

Firing commenced on Sept. 11th with a power-packed line-up under threatening skies as **James T. Morris** of Akron Creedmoored **Larry Wilkens** of Seville, Ohio, with 400-31X at 50-yds. metallic . . . **Ted Charlton's** 400-34X outranked **Kenneth Johnson's** 34X possible at 50-meters iron. . . . Then—**Johnson** opened up and Creedmoored **Roy Oster** with a 400-35X over the Dewar Course . . . And, finally, **Larry Wilkens** broke the first day's Creedmoor "spell" with a 400-29X win over Loren Samsel, Jr.'s 400-26X.

That gave the **Metallic Aggregate** to the **National Any Sight Champion** and runner-up in the 1965 National Championship—**Larry Wilkens** whose shooting merely improves with age. He took it with 1599-120X, as Ken Johnson fired 1598-127X . . . High Expert was Alfred Nagel, Latrobe, Pa.—1588-101X . . . SS: Richard Goodwin, Pochasset, Mass.—1587-97X; Mkx: Richard McDonel, Otis AFB., Mass.—1582-89X; Hi Junior—John Weaver, Oil City, Pa.—1591-99X.

Immediately following Saturday's

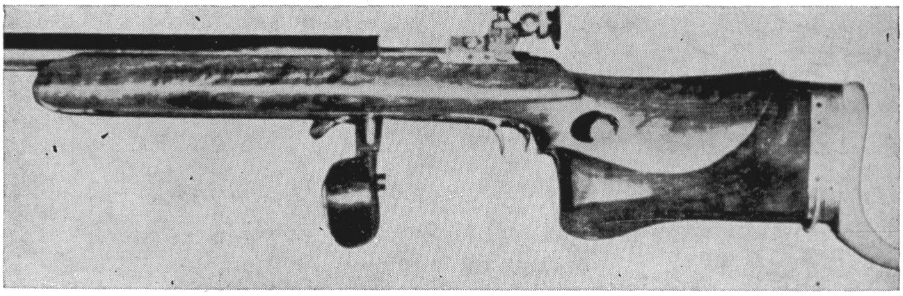
TRADIN' POST

Classified type ads; no display. **Rates:**—10¢ per word per insertion, prepaid. Minimum charge $1.00. Closing date for ads is the last Saturday of the month preceding publication.

Groups of figures, abbreviations and initials count as words. Hyphenated word counts as two words. Name and address of advertiser is counted. Use full words instead of initials and abbreviations and make your meaning entirely clear — get your money's worth.

CHEMICALLY STABILIZED TARGET AND SPORTER STOCKS
Will Not Shrink, Swell, or Warp at Any Extreme of Humidity

A product of modern research and technology—made to government specifications by a government-perfected process first developed for and tested by Military marksmen. The superiority of these fine stocks has been conclusively demonstrated by champions at Camp Perry and other top-flight competition. Priced only slightly higher than ordinary laminated stocks of comparable style, size, and grade of wood.



Choice of nine styles of target and sporter stocks, all stabilized, made from a wide variety of fine domestic and exotic hardwoods. Also unshaped, stabilized laminated blanks of any size desired. If none of our stocks exactly meets your requirements, we will exactly duplicate, from a stabilized laminated blank of your choice, your old stock or any pattern you send us. We make no additional charge for this custom service, which is especially tailored to the needs of target shooters.

Send 50¢ for illustrated catalog
THE CRANE CREEK GUN STOCK COMPANY, INC.
P. O. Box 268, Waseca, Minn.

matches, the postal team match was fired, with the following excellent results: Johnson—400-29X; Oster—397-27X; Charlton—400-32X; Whipple—400-31X; Samsel, Sr.—400-29X; Richard Morgan—399-32; Paul Frey—400-30X; H. Swarts—398-25X; Joy De Sensi—400-27X; C. H. (Bob) Kline—397-21X.

On September 12th, the number of competitors had dwindled to about 40 "hardy souls" and the Pittsburgh firing line resembled a tent and umbrella city as the rains fell. The Creedmoor "jag" resumed as **Carlton De Hart** of Hagerstown, Md., took the 50-yd. any from former National Champion **Robert Moore**—400-38X . . . **Charlie Whipple,** Somerset, and **Oran Weaver,** Oil City, Pa., were #1 and #2 in the meter—400-37X . . . **Bob Moore** and **Ted Charlton's** 400-36's in the Dewar were separated by Rule 15.6 . . . and **Charlton** took the 100-yd. without any argument—400-29X over **Johnson's** 400-27X.

Ted Charlton won the **Int'l Agg.**—800-70X over Johnson's 800-61X . . . He couldn't afford the loss of a point, so he cleaned the scope matches with 1600-136X. Johnson was breathing down his neck with a 1599-134X.

Behind their winning 3197-261X, we find Expert Nagel—3178-214X; SS—Goodwin—3178-205; Mks — McDonel — 3173-191X; Hi Junior, **John Weaver** is a shooter to watch. He fired a 3186-215X . . . **Joy De Sensi** of Pittsburgh won the State Ladies' Championship with 3171-189X.

***

My warmest wishes to each of you for a happy Yuletide season!!! To **Pres Kendall in Vietnam**—give the Viet Cong a sample of your best head shots as a Christmas present from us. We are glad that the Viet Cong sniper who shot at you from 75-yds. was a lesser marksman than you are. Best of luck!

---

model of the 30 caliber M1 bullet. The rifling was scaled up the same proportions, if I recall correctly, about 16" but had same angle of departure. When they first started playing around with a .224 they had Sierra make thousands of a beautiful little boattail bullet of, I believe, 78 grains. It never gave the accuracy expected. It certainly would give no accuracy in the 14" twist of conventional 22 barrels designed for the short bullets. This little streamlined, long pointed bullet should have had a twist of about 7½". Let's scale our 139 grain Norma bullet in 264 caliber up to 308. We would come up with one longer than the 200 grain Match King and it would weigh about 20 grains more. A 12" twist would probably not give match accuracy. A 9" twist would be better for this long, scaled up bullet.

I believe that 139 grain 6.5 the long lean point makes this harder to stabilize than the 160 grain round nose Hornady or 156 grain foreign makes. An interesting fact while fireforming those 400 cases; I had a little fun experimenting at the same time. I was using 156 grain cheap hard-nose tin plated copper jacketed bullets. I loaded these down to around 2400 and had signs of tumbling, but at 2800 groups improved and bullet holes were round. This was in my 8" twist, too. At 3000 with Hornady 160 grain I got very good groups.

I hope I have given you details usually lacking in some of the 6.5 articles. I also hope you find some of this interesting even though I am sure you will not agree with my theories or thinking. Before closing, I might add I have had some experience through a friend with a 6.5/30-06, also my son has one. 4831 powder seems to be best in this case; both have 9" twist and use 139 grain Norma exclusively. Ballistically over 1000 yards they compare with the big 30 caliber magnums; that is wind and trajectory.

Sincerely yours,

Paul Wright

GRIPS BULLETS ALL-AROUND!
Pulls Smoothly Without Stripping

FORSTER BULLET PULLER

Far more practical than Inertia-type pullers. Uses firm "pull" through positive leverage of standard loading press. Hardened steel collet grips and tightens as it extracts, without damage. Engineered of blued steel; no plastic parts. Fits wide range of calibers. See your dealer or order direct.

BULLET PULLER, one collet	$4.75
Extra Collets	$1.50

Write Dept. 33 for Catalog.

ACCESSORIES

FORSTER CASE TRIMMER, 1 COLLET & 1 PILOT	$14.25
OUTSIDE NECK TURNER, WITH ONE PILOT	$10.75
INSIDE NECK REAMER	$5.50
PRIMER POCKET CLEANER, WITH CENTER	$2.00
INSIDE-OUTSIDE CASE CHAMFERING TOOL	$2.75
STOCKMAKERS HAND SCREWS, PAIR	$2.00
STOCK INLETTING GUIDE SCREWS, EACH	$.35
UNIVERSAL HOLLOW POINTER FITS ANY CALIBER. IN EITHER 1/16" or ⅛" drill size	$4.75
30/06 BULLET NOSE TRIMMER FOR REMOVING THE POINT SQUARELY AND UNIFORMLY FROM MILITARY CARTRIDGES PRIOR TO HOLLOW POINTING	$4.75
PRIMER POCKET CHAMFERING TOOL FITS ANY SIZE PRIMER POCKET, WITH CENTER	$5.00

FORSTER APPELT, Lanark, Ill.

LAMINATED BLANKS

. . . for Precision Shooters!

(As formerly offered by Owens of Watkins Glen, N. Y.)

Length: 34 and 36 inches
Depth at butt: 7 inches
Depth at fore-end: As shown below

2½" Blank	7 ply	$15.00
3" Blank	10 ply	20.00
3" Blank	20 ply	35.00
3½" Blank	12 ply	22.50
3½" Blank	25 ply	40.00
4¼" Blank	13 ply	25.00

Also!

Combination Laminated Blanks by Fajen

2½" Blank 1/16" Maple–1/28" Walnut	$24.00
2¾" Blank 1/16" Maple–1/28" Walnut	$27.50

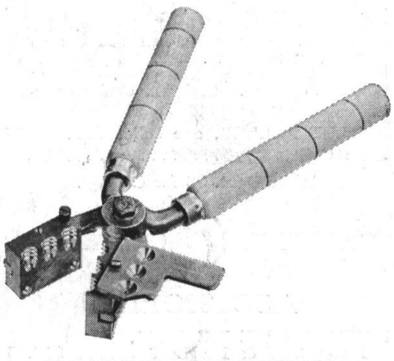
AND Fajens "THUMB HOLE"

Free Stock Style

. . . with side thumb rest and thumb hole. Write for prices.

Send $1.00 for Fajen's colorful new catalog of custom and regular style target and bench-rest stocks; machine-shaped or completely finished and fitted.

REINHART FAJEN
INCORPORATED
WARSAW, MISSOURI



SAECO-CRAMER

Custom - Precision

BULLET MOULDS

The nationally known SAECO-Cramer moulds are again available. Careful machining and SAECO craftsmanship make these moulds of the highest quality.

For Free bullet mould literature write: SAECO, Dept. P. S. 12
3270 E. Foothill
Pasadena, Calif. 91107

SAECO
PRECISION CARTRIDGE RELOADING EQUIPMENT
SANTA ANITA ENGINEERING CO.
OF CALIFORNIA • PASADENA

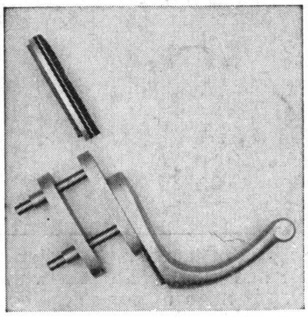
FOR THE SHOOTER BY A SHOOTER

BSA

MARTINI-INTERNATIONAL

Mark III BSA .22 Target Rifle—
HEAVY WEIGHT 14½# or LIGHTWEIGHT
12#BSA For Right Hand or Left Hand Shooter
It Is Supreme — It Is Accurate

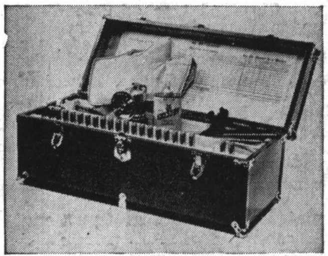
MARK III Less sights	$210.00
MARK III with 1-8 Min Parker-Hale sights	$245.00
MARK III with Freeland sights	$280.00



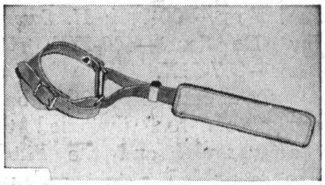
Freeland "61" International Butt Plate $33.00

Swiss Type Palm Rest

All Angle Tripod



Freeland 30 Caliber Kit	$13.50
48¾" Rifle Trunk	$26.25
¼ Opening small bore kit	$20.00
Freeland 31" Accessory Kit, ½ tray	$17.75



Mid-Century Cuff, Comb. .. $8.50

FREELAND Olympic All Aluminum Butt Plate	$13.50
FREELAND Base Plate with Free Rifle Hook, Oly.	$20.00
FREELAND Butt Plate with Rubber Pad, Olympic	$16.00
FREELAND Free Rifle Hook Only, Olympic	$11.50
Butt Plate Spacer ½" or ¾"	$7.00

REGAL BIPOD, mention scope	$23.50
FREELAND DEWAR CART. BLOCK	$2.55
Foam padded Freeland glove	$5.25
BSA MARK III OLY. PALM REST	$17.50
Freeland SWISS TYPE PALM REST	$20.50
FREELAND PALM REST, ball type	$15.50
52D–OLY. PALM REST	$16.50
FREELAND ALL ANGLE TRIPOD, in green, gray or black, mention scope	$15.25
Bipod GALLERY SPEC. SCOPE STAND	$18.90
FREELAND BIPOD, mention scope	$17.50
FREELAND Carwindow attachment	$8.50
Freeland Superior Front Sight	$16 .00
FREELAND TUBE rear sight	$42.50
Freeland Fore End Stops 52M, 52T, 75, 513, 40X and 521T	$3.00
"AR" SHOOTING MAT	$27.00
FREELAND 52-D FORE-END STOP	$4.50
Freeland Sling Keeper	$1.25
Kneeling Pad	$5.25
Freeland Pistol Box Adapter	$5.25
ZOOM TRIPOD	$16.25

ZLC ZOOM scope leather case	$6.25
Freeland Recoil Spring	$4.00
ZIPPER CASE, for most scopes	$5.25
DeLuxe Cuff & Hook	$4.25
61-S Olympic 1¼" cuff-sling	$6.00
Freeland tapered cuff combination #61A	$6.75
Freeland AF55L Exceptional Leather RIFLE CASE	$37.00
10-X Rifle Coat	$22.00

ALL GUNS FROM AIR GUNS TO FINEST TARGET AND HUNTING WEAPONS

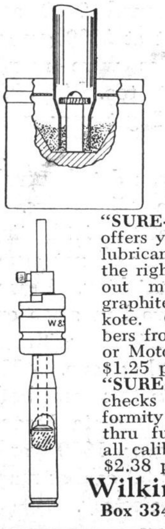
Write us for all your Gun, Scope, Mount, Sight and Reloading Needs.

Freeland and BSA Pamphlets Free

FREELAND'S SCOPE STANDS, INC.

Al Freeland, Nationally Known Rifleman

3737 14th Ave., ROCK ISLAND, ILL. 61201



Re-loaders

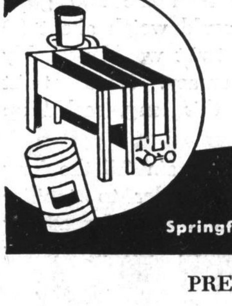
"SURE-MARK" Case Lubricator offers your choice of the best dry lubricants for neck resizing—just the right amount is applied without muss or fuss. Microfyne graphite, Motor Mica or Molykote. Complete unit for all calibers from .22 to .50. Microfyne or Motor Mica $1.00. Molykote $1.25 postpaid.

"SURE-MARK" Charge Gauge checks powder charge for uniformity and safety. Adjustable thru full range of charges and all calibers from .22 to .50. Price $2.38 postpaid.

Wilkins & Schultz, Inc.
Box 334, Barrington, Ill. 60010

The Gunsmith BLACK FINISHING UNIT

Made especially for the man who wants to do the best in firearm refining – for himself or for profit. This same process is used by manufacturers. Comes complete with tanks, burners, supply of PENTRATE crystals, instructions and all equipment needed. Write for details.



HEATBATH CORPORATION
Springfield 1, Massachusetts